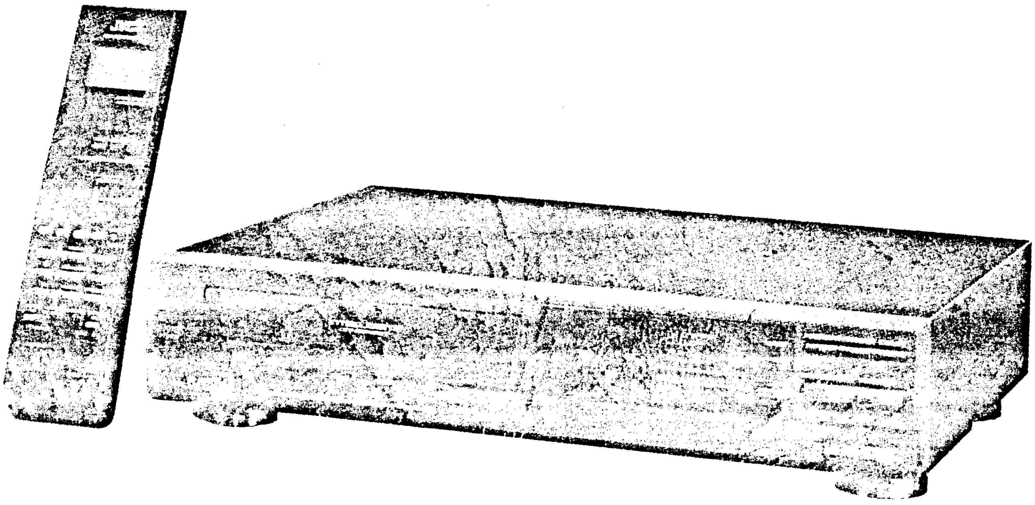
JVC

SERVICE MANUAL

Hi-Fi STEREO VIDEO CASSETTE RECORDER VHS PAL

HR-D860E/EG



SPECIFICATIONS (The specifications shown pertain specifically to the model HR-D860EG)

GENERAL

Power requirement	:	AC 220 V∼, 50/60 Hz
Power consumption	:	32 W
Temperature	:	5°C to 40°C (Operating)
	:	−20°C to 60°C (Storage)
Operating position	:	Horizontal only
Dimensions (WxHxD)	:	435 x 95 x 334 mm
Weight	:	5.6 kg
Format	:	VHS PAL standard
Tape width	:	12.65 mm
Tape speed (SP)	:	23.39 mm/sec
(LP)	:	11.70 mm/sec
Maximum recording time (SP)	:	240 min. with E-240 video cassette
(LP)	:	480 min. with E-240 video cassette (Hi-Fi audio only)

VIDEO

Signal system	:	PAL colour and CCIR monochrome signals, 625 lines/50 fields
Recording system	:	Rotary, two-head helical scan system with a slant double-azimuth combination video head
Input	:	0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output	:	1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio	:	43 dB (Rohde & Schwarz noise meter) with BILDSCHÄRFE control at centre position
Horizontal resolution	:	250 lines with BILDSCHÄRFE control at centre position

AUDIO

Input	:	Mic: -67 dBs, high impedance, unbalanced
	:	AUDIO EING. connector (RCA x 2): -8 dBs, 50 k-ohms, unbalanced
	:	AUDIO/VIDEO socket (21-pin Peri connector):-3.8 dBs, (CENELEC standard), 50 k-ohms, unbalanced
Output	:	AUDIO/VIDEO socket (21-pin Peri connector):-3.8 dBs, (CENELEC standard), high-impedance load
	:	AUDIO AUSG. connector (RCA x 2):-6 dBs, high-impedance load less than 1 k-ohm, unbalanced (100 k-ohms, load)

NORMAL AUDIO

Recording system	:	Longitudinal track
No. of audio channels	:	1 (monaural)
Frequency range	:	70 Hz to 10,000 Hz

Hi-Fi AUDIO

Recording system	:	Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels	:	2 Hi-Fi audio channels
Frequency response	:	20 Hz to 20,000 Hz
Dynamic range	:	More than 90 dB
Wow and flutter	:	Less than 0.005% WRMS

TUNER

Tuning system	:	Frequency synthesized tuner
TV channel storage capacity	:	48 positions (+ AUX position "AU")
Channel coverage	:	VHF 47 — 111 MHz
		111 — 300 MHz
		UHF 470 — 862 MHz
Aerial output	:	UHF channel 36 (adjustable 32 — 40)

TIMER

Clock reference	:	Quartz-crystal
Programme capacity	:	1-year/8-programme timer
Memory back-up time	:	Minimum 3 min.

ACCESSORIES

Provided accessories	:	Aerial cable, Infrared remote control unit, "R6" battery x 2, Audio cable (RCA-RCA) Video cable (RCA-RCA)
Optional accessories	:	VPV adapter VU-V120E VPT adapter VU-V140E

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

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No. 82184
June 1990

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

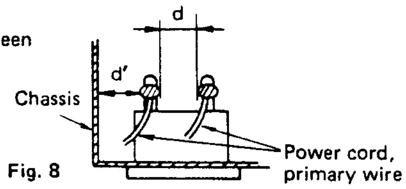

Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method: (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

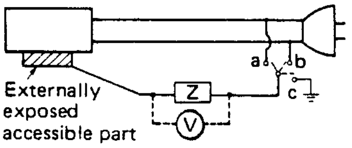

Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

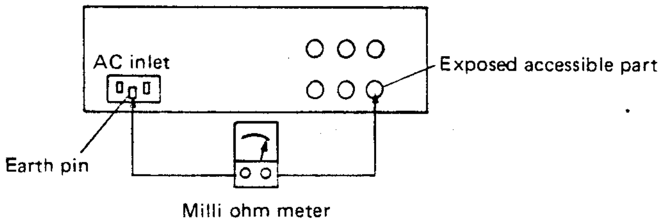

Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 µF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

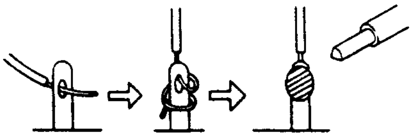

Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

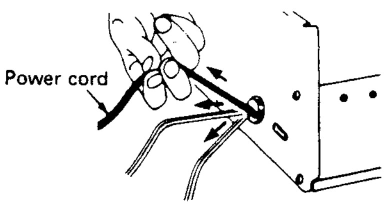

Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number :** E03830-001
    2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

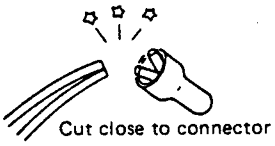

Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

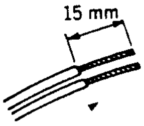

Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

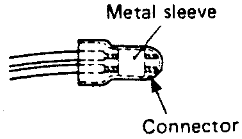

Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

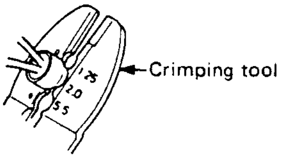

Fig. 6

(5) Check the four points noted in Fig. 7.

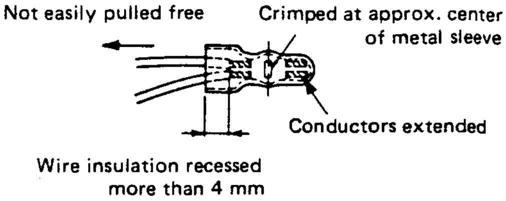
Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

NOTE: For a technical description, please refer to Technical Guide VTG82056 HR-D860 PAL.

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1. The Instructions shown pertain specifically to the Model HR-D860EG. For detailed descriptions, be sure to consult the Instruction booklets of the other Models.
2. The following table lists the differing points between Models (HR-D860E and HR-D860EG) in this series.

Item / Model			HR-D860EG	HR-D860E
TV TUNER	Channel coverage	VHF	47 to 111 MHz	← *1)
			111 to 300 MHz	← *1)
			No	302 to 470 MHz
		UHF	470 to 862 MHz	← *1)
TIMER	Memory back-up time		Minimum 3 min	60 min
	VPS		Built-in	Option (VU-V110E)
TELETEXT	VPV		Option (VU-V120E) *2)	Option (VU-V100E) *3)
	VPT (with TOP) *4)		Option (VU-V140E) *2)	Option (VU-V150E) *3)

Notes: **1) ←The same as model at left.* **2) VU-V120E/VU-V140E without VPS*
**3) VU-V100E/VU-V150E with VPS* **4) TOP: Table of page*

SAFETY PRECAUTIONS

The rating plate and the safety caution are on the rear of the unit.

WARNING — DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with the following code:

Blue to N (Neutral) or Black
Brown to L (Live) or Red

If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt — consult a competent electrician.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

Omkopplaren BETRIEB på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge BETRIEB OFF.

The BETRIEB button does not completely shut off mains power from the unit, but switches operating current on and off.

BEMAERK: I stilling OFF er apparatet stadig forbundet med lysnettet Hvis det ønskes fuldstændig afbrudt skal netledningen trækkes ud.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC, 87/308/EEC and Standard IEC Publ. 65.

WARNING
The switched AC outlet should not be used for connection of TVs and other apparatus in which unintended switching could result in fire or other hazard.

WARNING
There are two different types of SECAM colour systems: SECAM-L, used in FRANCE (also called SECAM-West), and SECAM-B, used in the GRD, e.g. (also called SECAM-East).

1. This recorder can also receive SECAM-B colour television signals for recording and playback.
2. Recordings made of SECAM-B television signals produce monochrome pictures if played back on a video recorder of SECAM-L standard, or do not produce normal colour pictures if played back on a PAL video recorder with SECAM-B system incorporated (even if the TV set is SECAM-compatible).
3. SECAM-L prerecorded cassettes or recordings made with a SECAM-L video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used for the SECAM-L standard. Use a SECAM-L recorder to record SECAM-L signals.

IMPORTANT: It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.

VHS PAL HQ

- *Only cassettes marked "VHS" can be used with this video recorder.*
- HQ VHS is compatible with existing VHS equipment.

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PRECAUTIONS

VIDEO RECORDER

Handling and storage

- Avoid using the recorder under the following conditions:
  - — extremely hot, cold or humid places,
  - — dusty places,
  - — near appliances generating strong magnetic fields,
  - — places subject to vibrations, and
  - — poorly ventilated places.
- Be careful of moisture condensation.
- Avoid using the recorder immediately after moving from a cold place to a warm place. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully
  - Do not block the ventilation openings.
  - Do not place anything heavy on the recorder.
  - Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - Use in horizontal (flat) position only.
- In case of transportation,
  - Avoid violent shocks to the recorder during packing and transportation.
  - Before packing, be sure to remove the cassette from the recorder.

Moisture condensation

- If you pour a cold liquid into a glass, water vapour in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture condensation is apt to occur under the following conditions:
  - — when the recorder is moved from a cold place to a warm place, and
  - — under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the power switched on; this will help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

VIDEO CASSETTES

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

REMOTE CONTROL UNIT

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

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FEATURES

MAIN FEATURES, ADVANTAGES AND BENEFITS

Feature	Advantage	Benefit
Hi-Fi VHS system	Stereo sound with a dynamic range of more than 90 dB — outclasses even the finest conventional audio decks and approaches CD quality.	■ Can experience superb "cinematic" sound right in your own living room. ■ Hi-Fi VHS software can be enjoyed with full impact.
Quick-Response Full-Loading Mechanism	■ Quick response: 1.3 seconds from Stop to Play or Record. ■ Increased Rewind/Fast-Forward speed.	■ Immediate, no-frustration operation of VCR. ■ Faster Rewind/Fast-Forward saves time.
Digital AV Tracking	Microcomputer-controlled system maintains constant optimal tracking of the Hi-Fi audio and video tracks.	Best possible picture performance, even for rental videos, is always assured.
Intelligent Blank Search System	Microcomputer-controlled system automatically seeks out the unrecorded portion on a tape (absence of control pulses) and automatically displays tape's remaining time.	■ Makes additional recording onto partially recorded tapes more simple and convenient. ■ Allows more efficient use of tapes.
Intelligent On-Screen Display System	On-screen display system for timer programming and mode check. You can select German, French, Italian or English for on-screen messages.	■ Easy-to-do, easy-to-see timer programming on the big, bright TV screen. ■ Dual-screen programming convenience in conjunction with remote's LCD.
Automatic Repeat Playback (possible up to 5 times)	■ Full Repeat: repeated playback of whole tape. ■ Index Repeat: repeated playback of segment located between two index codes.	You can repeatedly view favourite scenes with ease.
VPT-TOP Compatibility	Simply by connecting JVC's optional teletext adapter (VU-V140E), you add many extra features to the VCR; teletext viewing, simplified timer programming with auto VPS, and much more.	■ Compatibility with TOP system, as well as virtualy all other teletext systems. ■ Complete access to many valuable teletext services. ■ Viewing, recording, and timer-recording of closed-caption broadcasts; ideal for hearing-impaired viewers. ■ Automatic timer programming via the teletext schedule page; no need to refer to any printed TV guide.

OTHER KEY FEATURES

DA-3 (Double-Azimuth 3-Head) System — Makes possible noiseless stills, frame advance, slow and reverse slow, variable-speed search in both directions, and shuttle search with lock.

Realtime Go-To — Locates a point a specified time away from the beginning of the tape.

Realtime Search — Locates a point a specified time away from the current position.

Index Search — Automatic location of up to 99 index coded programmes. You can mark/erase index codes.

Intro Search — Plays back the beginning of each indexed programme for about 5 seconds in fast-motion.

Skip Search — Skips unwanted tape segments 1/2 to 2 minutes in length.

Duet Editing — Allows simultaneous control of two JVC VCRs by one remote control when editing.

Flexible timer functions — Timer programming flexibility thanks to 1-year/8-event timer, 24-hour instant timer, and "off" timer.

LCD-programmable, TV/VCR unified remote control — The remote's 4 independent programme memories make anytime anywhere programming possible for later transfer to the VCR's timer.

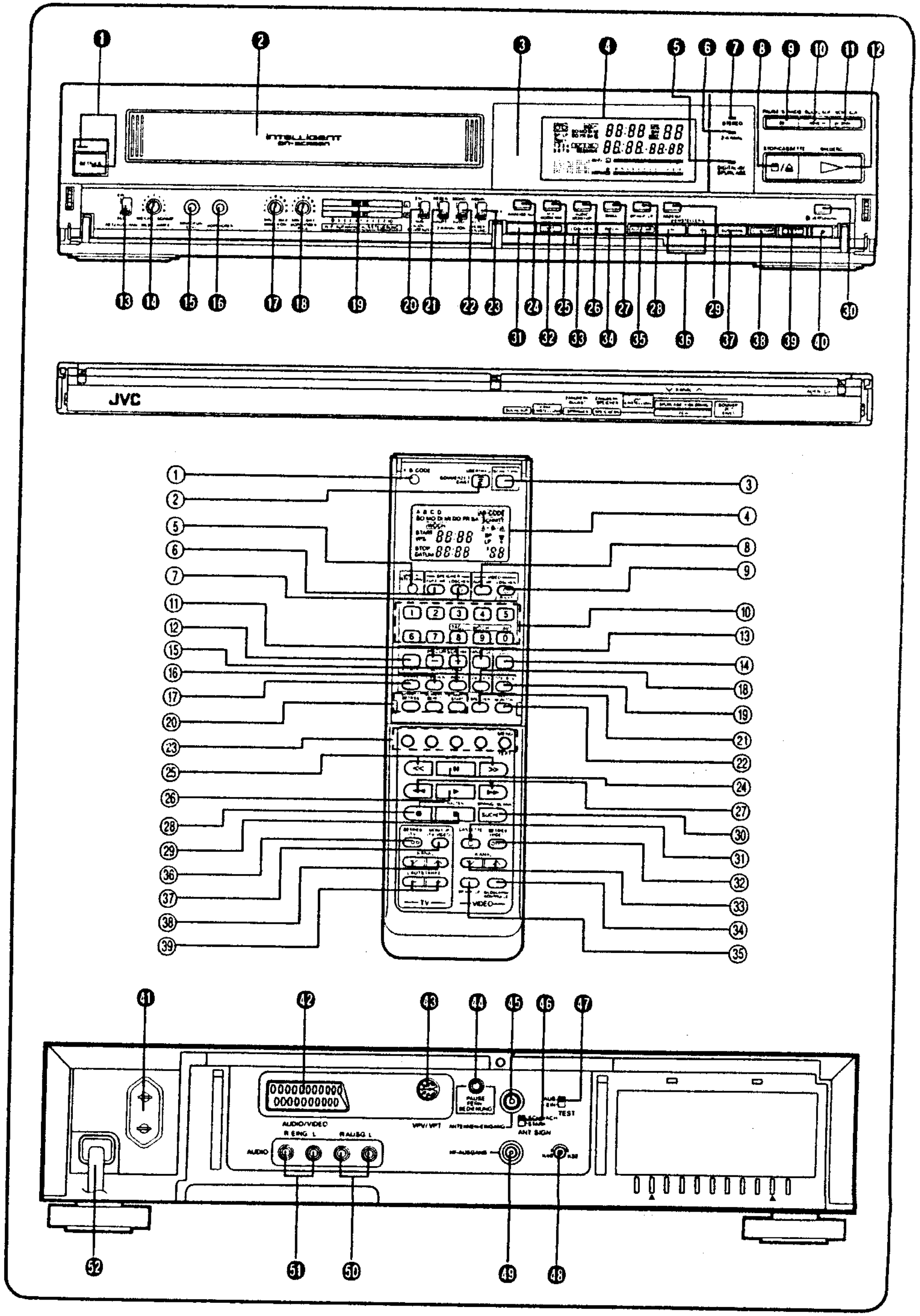
Instant "summer time" adjustment — One-button adjustment of VCR's clock to and from daylight saving time.

Child Lock system — Temporarily disables VCR's controls to deter unwanted operation.

Audio dubbing — Makes it possible to add a new soundtrack to a video tape without affecting the original Hi-Fi track.

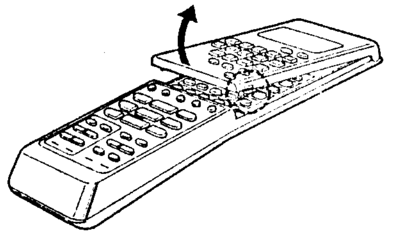
Display OFF function — Can switch off FDP to eliminate bothersome light and reduce chances of theft.

Preroll-capable pause remote control terminal — For superior quality edits when used in an editing suite.



Remote Control Unit

Grasp the cover where the side tab is located and swing open the cover.

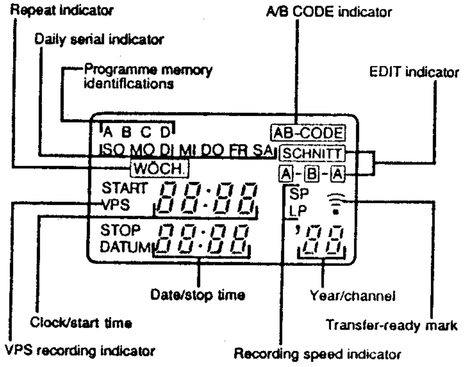


① **A/B-CODE button**
When using two JVC video decks, press to switch this remote control from the "A" mode to "B" mode, or vice versa, depending on the deck to be controlled. (See pages 43 and 68.)

② **Transfer/Summer time adjust button (ÜBERTRAG/SOMMERZEIT EINST.)**
This is a dual-function button.
- as a ÜBERTRAG button — press to transfer the data held in the remote control's timer memory to the recorder.
- as a SOMMERZEIT EINST. button — press to adjust the remote control's clock to the summer time setting. (See page 50.)

③ **Timer button (SCHALTUHR)**
Functions same as ㉝.

④ **LCD (Liquid Crystal Display) panel**
Refer to this panel when programming the remote control's built-in timer memory.



⑤ **Clock adjust button (UHREINSTELLUNG)**
Press to adjust the clock of the remote control.

⑥ **Memory programme button (SPEICHER AUFZ. NR.)**
Press to programme the remote control's timer memory.

⑦ **Memory cancel button (SPEICHER LÖSCHEN)**
Press to cancel the programmed data in the remote control's timer memory.

⑧ **Video programme button (VIDEO AUFZ. NR.)**
Press to engage the recorder's Timer Set mode.

⑨ **Video cancel/Counter reset button (VIDEO LÖSCHEN/Z.-RÜCKST.)**
This is a dual-function button.
- as a VIDEO LÖSCHEN button — press to cancel the programmed data held in the recorder's timer memory in the Timer Set mode.
- as a Z.-RÜCKST. button — press to reset the Realtime Counter reading to "0st 00m 00s".

⑩ **Multi-purpose numeric keys**

Clock setting:	See page 50.
Channel selection:	See page 51.
Timer Programming:	See page 62.
Realtime Go-To and Search functions:	See page 64.
Index Search:	See page 65.
External Source recording:	See page 67.

⑪ **Set (–/+)/Cursor (⊢—/—⊣) buttons (EINSTELLEN/CURSOR)**
These are dual-function buttons.
- as EINSTELLEN buttons — press to set the correct data in on-screen remote programming.
- as CURSOR buttons — press to move the cursor to the position for data entry when programming the remote control's timer memory.

⑫ **Select button (AUSWAHL)**
Press to select the item to be set in on-screen remote programming.

⑬ **Display button (ANZEIGE)**
Press to switch the display among the realtime tape counter, remaining tape time and date.
Also press to change the display from the Timer Set mode to the Clock mode.

⑭ **VPS/Channel set button (VPS/KANAL)**
Functions same as ㉜.

⑮ **INDEX button**
Press to engage the Index Search mode. (See page 65.)

⑯ **Erase button (LÖSCHEN)**
Press during playback to erase an index code. (See page 65.)

⑰ **Mark button (MARKE)**
Press during playback or recording to put an index code onto the tape. (See page 65.)

⑱ **Go-To button (ZIELLAUF)**
Press to engage the Realtime Go-To mode. (See page 64.)

⑲ **Intro button (TITELBILD)**
Press to engage the Intro Search mode. (See page 65.)

⑳ **Duet editing mode, Stand-by and Start buttons (SCHNITT-BETRIEB, SCHNITT-BEREIT, SCHNITT-START)**
Duet Editing controls for simultaneous control of two JVC decks in editing. (See page 68.)

㉑ **Counter memory button (Z.-SPEICHER)**
Functions same as ㉝ as a ZÄHLWERK-SPEICHER button.

㉒ **AUDIO MONITOR button**
Functions same as ㉖.

㉓ **Teletext buttons**
For teletext operation. (See page 72.)

㉔ **II (Pause/Still) button**

㉕ **<</>> (Variable search) buttons**
Press either button to search for a specific segment of the programme at variable speeds. (For details, see page 46.)

㉖ **► (Play) button**

㉗ **◄◄/►► (Rewind)(Fast-Forward)(Shuttle Search) buttons**

㉘ **● (Record) button**
Press together with the ► button ㉖ to start recording.

㉙ **■ (Stop) button**

㉚ **Skip/Blank search button (SPRING./BLANK SUCHL.)**
- Press in the Stop mode to engage the Blank Search mode. The tape will automatically stop at the beginning of a non-recorded section. (See page 59.)
- Press while in the Play mode to skip through unwanted tape segments. (See page 55.)

㉛ **Eject button (CASSETTE)**
Press while in the Stop mode to eject the cassette.

㉜ **Operate (video) button (BETRIEB (VIDEO))**
Press to turn the recorder power ON or OFF.
Keep this button pressed for 2 seconds when turning the power off to engage the Child Lock mode. (See page 63.)

㉝ **TV programme buttons (KANAL ∨/∧)**
Function same as ㉟ as a KANAL button.

㉞ **On-screen button (BILDSCHIRM KONTROLLE)**
- Press to select the language for on-screen messages.
- Press to cancel instantly the on-screen display (See page 43.)

㉟ **SP/HI-FI LP button**
Functions same as ㉘.

TV Operation buttons (designated JVC TV models only)

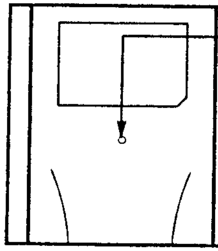
㊱ **Operate (TV) button (BETRIEB (TV))**
Press to turn the TV power on or off.

㊲ **MONITOR (TV/VIDEO) button**
Press to select the TV's operating mode.
TV: For viewing broadcast programmes or tape programmes via HF-AUSGANG connection.
VIDEO: For viewing programmes via the AV connection.

㊳ **Channel buttons (KANAL ∨/∧)**
Press to select a desired channel on the TV receiver.

㊴ **Volume buttons (LAUTSTÄRKE – / +)**
Press to decrease or increase the TV's sound volume.

Remote Control Unit's RESET button



RESET button
Insert a pointed object into the hole to press the initialize button inside, when required. The memory for the LCD display will be cleared. Normally do not touch this button.

Rear of the remote control

Note:
When the optional VPT (VPV) adapter is connected, all buttons located on the cover of the upper portion of the remote control unit function for teletext operation when the cover is closed. Also four coloured keys and several buttons located on the lower portion of the remote control have additional teletext functions, as indicated by their additional labels.

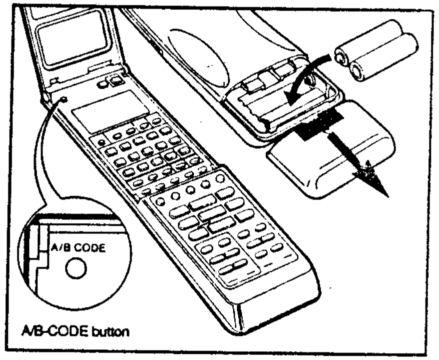
Remote Control Unit
A/B code switching
When you own two JVC video decks, this remote control can operate both decks separately; they do not respond simultaneously to the remote control's signal, if they are set to respond to different codes. Initially this recorder is set in the "A" mode.
To change the mode, carefully follow the instructions below:

(1) Unplug the power cord of the recorder from the AC outlet.
(2) Press the A/B-CODE select button to engage the "B" mode; "B CODE" will appear on the LCD.
(3) Plug the power cord of the recorder into the AC outlet.
(4) Turn on the power of the recorder using the remote control's BETRIEB (VIDEO) button ㉜.

The recorder "memorizes" this B code and will respond only to the B code signals. Set the other deck to respond to the A code signals in the same procedure.

Note:
Do not operate other remote controls after you have plugged the recorder into the AC outlet and before you press the BETRIEB (VIDEO) button of this remote control.

CAUTION:
Some televisions may malfunction in response to this remote control when used in the "B" mode. If this should happen, switch the mode back to "A".



A/B-CODE button

Operating distance for remote control unit
- The maximum operating distance is about 8 m.

Installing the batteries
- Insert two "R6"-size batteries (provided) into the battery compartment on the rear of the remote control unit, observing correct polarity.

CONTROLS, INDICATORS AND CONNECTORS

Refer to diagrams on the front foldout page.

Front panel

① Operate button (BETRIEB) with LED indicator
Press to apply operating power to the recorder. The LED indicator will light. Loading a cassette also turns the power on.

② Cassette loading slot
Insert a VHS cassette. The door will close and the "cassette loaded" indicator will appear on the FDP (fluorescent display panel).

③ Infrared beam receiving window

④ Fluorescent Display Panel (FDP)

⑤ Digital AV tracking indicator (DIGITAL-AV-SPURLAGE)
Lights in the Digital AV Tracking mode. Blinks while adjusting. (See page 54.)

⑥ Bilingual indicator (2-KANAL)
Lights when a bilingual programme is being received.

⑦ STEREO indicator
Lights when a stereo programme is being received.

⑧ Stop/Eject button (STOP/CASSETTE)
- Press while in the Stop mode to eject the tape.
- Press while in other modes to stop the tape.

⑨ Pause/Still button (PAUSE/STANDB.)
- Press while in the Record mode to stop the tape temporarily to avoid recording of unwanted material.
- Press while in the Play mode to view a still picture.
- The still picture can be advanced each time this button is pressed.

⑩ Rewind/Shuttle Search button (RÜCKLAUF)
- Press while in the Stop mode to rewind the tape.
- Press while in the Play mode for Shuttle Search in the reverse direction.
- Press while in the Record-Pause mode to engage the Retake mode. (See page 59.)

⑪ Fast-Forward/Shuttle Search button (VORLAUF)
- Press while in the Stop mode to fast-forward the tape.
- Press while in the Play mode for Shuttle Search in the forward direction.
- Press while in the Record-Pause mode to engage the Retake mode. (See page 59.)

⑫ Play button (WIEDERG.)
- Press to play back a tape.
- Press to cancel the Pause/Still or Shuttle Search mode (See page 56.)
- Press to start recording from the Record-Pause mode.
- Press to start audio dubbing from the Audio Dub Standby mode.

⑬ AC online switch (NETZAUSGANG)

AUS position:	Power is available from the rear panel AC outlet regardless of whether the recorder is on or off.
EIN position:	Power is available from the rear panel AC outlet only when the recorder is on. When used in combination with the built-in timer, this enables timer-controlled power supply for the connected equipment.

⑭ Picture sharpness control (BILDSCHÄRFE)
Turn this knob clockwise to make the picture sharper. Turn counterclockwise to give the picture a softer tone. Effective only for playback pictures. (No effect on recording.)

⑮ Microphone jack (MIKROFON-EING.)

⑯ Headphone jack (KOPFHÖRER)

⑰ Microphone mix control (MIKROFON-MIX)
For control of the microphone input level for microphone-mix recording via the MIKROFON-EING. jack ⑮. When making an adjustment, connect a pair of headphones to monitor the input level.

⑱ Headphone level control (KOPFHÖRER-PEGEL)
Adjusts the level of audio output from the headphone jack.

⑲ Hi-Fi audio recording level controls (Hi-Fi AUFNAHMEAUSSTEUERUNG)
Use to adjust the Hi-Fi audio recording level, referring to the audio level indicators on the display panel. (See page 48.)

⑳ Automatic level control switch (AUDIO-BEGRENZER)
Set to AUS when adjusting the hi-fi audio recording level manually.

㉑ TV sound select Main/Sub switch (2-KANALTON HAUPT/NEBEN)

HAUPT:	To record the main soundtrack (local language).
NEBEN:	To record the sub soundtrack (foreign language). (See pages 47 and 58.)

㉒ Stereo/monaural switch (AUTO/MONO)
Set to MONO when the quality of the stereo sound being received is poor. The broadcast will be received in monaural with improved results. (See page 58.)

㉓ Repeat switch (WIEDERHOLUNG)

KOMPL.:	To play back the entire tape repeatedly.
INDEX:	To play back a segment between two adjacent index codes. (See page 55.)
AUS:	No repeat playback.

㉔ Display Off button (ANZEIGE AUS)
To turn off the FDP.

㉕ Audio mix button (HI-FI/NORM/MIX)
Press to select for listening among either the hi-fi or normal soundtracks or a mixture of the two. (See page 48.)

㉖ AUDIO MONITOR button
Each time this button is pressed, the audio channel to be output changes and is indicated by the L and R indicators on the FDP. (See page 48.)

㉗ Simulcast button (SIMUL)
When recording FM simulcast TV programmes, press this button (anytime, except when in the AUX mode) to set to the simulcast mode. "SIM" will light on the FDP, and the video from the built-in tuner and the hi-fi audio signals from the rear panel AUDIO EING. connectors will be recorded. (See page 58.)

㉘ SP/Hi-Fi LP button
Normally set this button to the SP (Standard Play) mode ("SP" lights on the FDP). In the SP mode, both pictures and sound are recorded, allowing up to 4 hours of continuous recording on a single cassette (E-240).
When using this recorder as an audio deck, you can use the LP (Long Play) mode by pressing this button to obtain the "LP" indication on the FDP. In this mode, Hi-Fi audio recording is possible for up to 8 hours with a single cassette (E-240).

㉙ Display button (ANZEIGE)
Press to switch the display between the realtime tape counter, remaining tape time, and date. Also press to change the display from the Timer Set mode to the Clock mode.

㉚ Audio dubbing button (VERTONUNG)
Press while in the Still mode, then press the WIEDERG. button ⑫ to start audio dubbing.

㉛ Search button (SUCHLAUF)
Press to initiate real channel automatic scan tuning. (See page 52.)

㉜ VPS/Channel set button (VPS/KANAL-EINSTELLUNG)
This is a dual-function button.
- as a VPS button — press to enter the VPS command while in the Timer Set mode.
- as a KANAL-EINSTELLUNG button — press to engage the Real Channel mode.

㉝ Cancel/Counter reset/Skip button (LÖSCHEN/ZÄHLWERK-RÜCKST./SPRINGEN)
This is a triple-function button.
- as a LÖSCHEN button — press to cancel the programmed data in the Timer Set mode.
- as a ZÄHLWERK-RÜCKST. button — press to reset the realtime counter reading to "0St 00M 00S".
- as a SPRINGEN button — press to skip unnecessary channels in the Real Channel mode.

㉞ Repeat/Counter memory/Store button (WÖCH./ZÄHLWERK-SPEICHER/SPEICHERN)
This is a triple-function button.
- as a WÖCH. button — press to enter the repeat command in the Timer Set mode.
- as a ZÄHLWERK-SPEICHER button — press to engage the Counter Memory mode.
- as a SPEICHERN button — press to store the tuned-in channel in the Real Channel mode.

㉟ Programme/Clock adjust button (AUFZ. NR./UHREINSTELLUNG)
Press to change the recorder's mode in the following order: Clock mode, Timer Set mode, Clock Set mode, then return to the Clock mode.

㊱ Set/TV programme/Tracking/Vertical Lock/Fine tuning (-/+) buttons (EINSTELLEN/KANAL/SPURLAGE/V-BILDFANG/FEIN)
These buttons have five functions.
- as EINSTELLEN buttons — press to set the correct data in the Clock Set or Timer Set mode.
- as KANAL buttons — press either button to scan to a desired channel.
- as SPURLAGE buttons — press both to cancel the automatic Digital AV Tracking mode, then press either for manual tracking control. (See page 54.)
- as V-BILDFANG buttons — press either to reduce vertical vibrations, if observed in the Still mode.
- as FEIN buttons — press to shift the frequency in either direction to fine-tune in a specific station in the Real Channel mode.

㊲ Select/Summer time adjust button (AUSWAHL/SOMMERZEIT EINST.)
This is a dual-function button.
- as a AUSWAHL button — press to select the item to be set in the Clock Set, Real Channel or Timer Set mode.
- as a SOMMERZEIT EINST. button — press and quickly release to advance the clock by one hour, hold it pressed for 2 seconds to set the clock back by one hour (See page 49.)

㊳ Timer button (SCHALTUHR)
Press to engage the Timer Standby mode.

㊴ START button
Press to engage the 24-Hour Instant Timer Set mode. (See page 60.)

㊵ Record/Instant Timer Record button (AUFN./DA)
- Press once to start recording.
- Press twice to engage the Instant Timer Recording mode.
- Also use to set the required recording time in the 24-Hour Instant Timer Set mode.

Rear Panel

㊶ AC outlet (GESCHALTET)
Connect the power cord of other audio or video equipment (such as an FM tuner) requiring less than 2 amperes of power.
Warning:
The switched AC outlet should not be used for connection of TVs and other apparatus in which unintended switching could result in fire or other hazard.
This outlet is controlled by the NETZAUSGANG switch ⑬.
When the NETZAUSGANG switch is set to AUS, this outlet supplies (220 V∿, 50/60 Hz) regardless of the BETRIEB button setting as long as the power cord of the recorder is plugged in.
When the NETZAUSGANG switch is set to EIN this outlet supplies power only when the recorder is on.

㊷ AUDIO/VIDEO socket
A 21-pin standardised audio/video input/output socket for AV connection to a TV or a 2nd video recorder. The input from this socket can be recorded in the AUX mode engaged by obtaining "AU" in the channel display.

㊸ VPV/VPT connector
Connect the VPT (VPV) adapter for decoding teletext programmes and for teletext timer programming.

㊹ Remote pause terminal (PAUSE FERNBEDIENUNG)
When using this recorder as the source player, connect to the PAUSE OUT terminal of a second VCR (if so-equipped) for synchronized preroll operation. This terminal can also be used for editing from a JVC VideoMovie camera/recorder using the Master Edit Control system.

㊺ Aerial input connector (ANTENNEN-EINGANG)
Connect an aerial to this connector.

㊻ Attenuator switch (ANT. SIGN.)
Set to SCHWACH to receive broadcasts from distant stations. Set to STARK to receive broadcasts of high field strength.

㊼ TEST signal switch
Set to EIN when tuning your TV receiver for the video channel.A test signal in the form of two vertical white bars will be available.

㊽ RF converter frequency adjustment screw (K40 – K32)
(See page 45.)

㊾ RF output connector (HF-AUSGANG)
Connect to the aerial terminal of a TV receiver through the aerial cable (provided).

㊿ Audio output connectors (AUDIO AUSG.)
Both hi-fi and normal audio signals can be obtained from these connectors. The output can be selected with the AUDIO MONITOR button ㉖ and Hi-Fi/NORM/MIX button ㉕.

(51) Audio input connectors (AUDIO EING.)
Connect an audio tape recorder or other audio sources for recording sound.

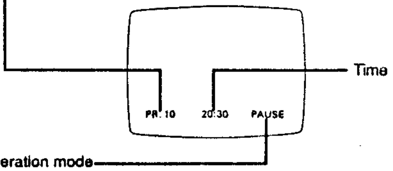
(52) Power cord

ON-SCREEN MODE DISPLAY

Four-language on-screen display is available for timer programming (see page 61) and mode check. To select the language, press the remote control's BILDSCHIRM KONTROLLE button for longer than 2 seconds while a mode check display is on the screen. The screen will display "DEUTSCH", "FRANCAIS" and "ITALIANO" and "ENGLISH" in that order where the operation mode is otherwise displayed. Simply release the BILDSCHIRM KONTROLLE button at the language you want.

Channel number or AUX mode

German	French	Italian	English
PR. AU	CH. AU	PR. AU	PR. AU


PR. 10
20:30
PAUSE
Time

Operation mode

	German	French	Italian	English
• Play mode	LAUF	LECT	RIPRO	PLAY
• Record mode	AUFN	ENR	REG	REC
• Fast forward mode	VL	AV	AVANZ	FF
• Rewind mode	RL	RET	RIAVV	REW
• Pause mode	PAUSE	PAUSE	PAUSA	PAUSE

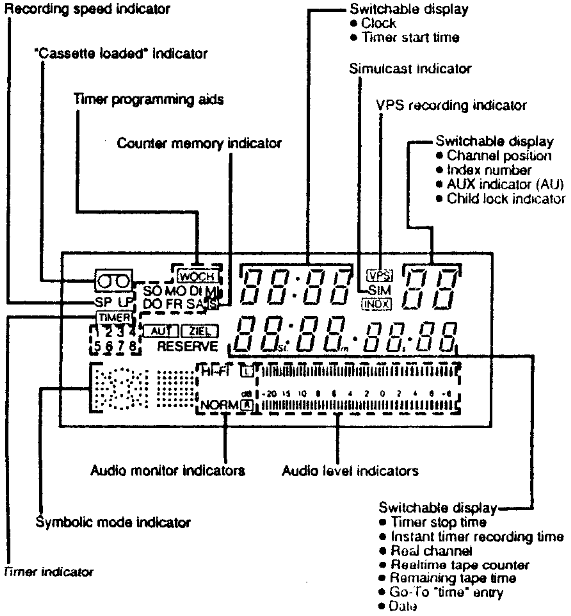
Automatic Indication

- Channel number is displayed each time a different channel (or AUX mode) is selected.
- Time is displayed whenever the channel or operation mode is changed.
- Mode is displayed for 5 seconds each time the operation mode is changed to Record, Play, Fast Forward or Rewind from any other mode. The PAUSE indication remains on for as long as the Record-Pause mode is engaged.

Manual recall

- For checking of the channel, time, or mode, press the BILDSCHIRM KONTROLLE button. The corresponding indication will be available on the screen for 5 seconds. To instantly cancel the on-screen display, press the BILDSCHIRM KONTROLLE button again.

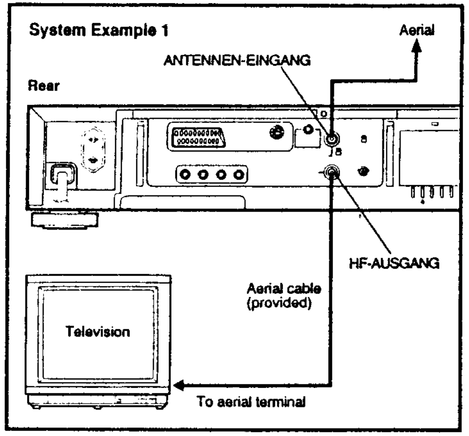
DISPLAY PANEL INDICATIONS


Recording speed indicator
"Cassette loaded" indicator
Timer programming aids
Counter memory indicator
Switchable display
• Clock
• Timer start time
Simulcast indicator
VPS recording indicator
Switchable display
• Channel position
• Index number
• AUX indicator (AU)
• Child lock indicator
WOCH
SO MO DI MI
DO FR SA S
SP LP
TIMER
1 2 3 4
5 6 7 8
AUT
ZIEL
RESERVE
VPS
SIM
INDX
HI-FI
L
NORM
R
dB -20 15 10 8 6 4 2 0 2 4 6 +6
Audio monitor indicators
Audio level indicators
Switchable display
• Timer stop time
• Instant timer recording time
• Real channel
• Realtime tape counter
• Remaining tape time
• Go-To "time" entry
• Date
Symbolic mode indicator
Timer indicator

Symbolic mode indicators

PLAY:	▷
FF:	⏩
REW:	⏪
FF VARIABLE SHUTTLE SEARCH:	▷ ⏩
REW VARIABLE SHUTTLE SEARCH:	◁ ⏪
STILL: FORWARD SLOW:	▷ ⏸
STILL: REVERSE SLOW:	◁ ⏸
RECORD:	○
RECORD PAUSE:	○ ⏸
AUDIO DUBBING:	◌

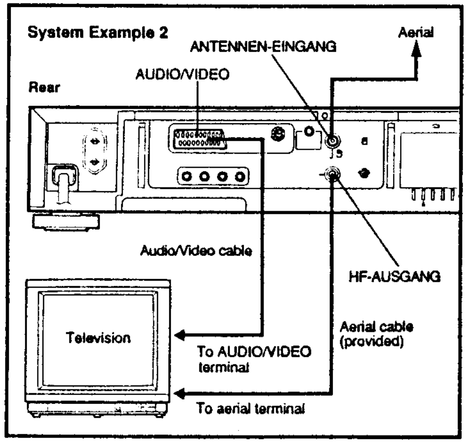
CONNECTIONS


System Example 1
Aerial
ANTENNEN-EINGANG
Rear
HF-AUSGANG
Aerial cable (provided)
Television
To aerial terminal

AERIAL AND RF CONNECTION

1. Remove the aerial cable from the television and reconnect it to the recorder's ANTENNEN-EINGANG connector. The recorder is then ready to record off-air programmes.
2. Connect the recorder's HF-AUSGANG connector to the televi-sion's aerial terminal using the provided aerial cable. The television is then ready to receive broadcast programmes. When you are not using the recorder, the TV signals are fed to the television via this terminal.

- If your television is equipped with the aerial terminal only, you view tape programmes also via this terminal. In this case, set the television to UHF channel 36 (or a UHF channel adjusted as the video channel). See "VIDEO CHANNEL SETTING" below.
- When a video tape is played back through the HF-AUSGANG connector, the audio is reproduced always as monaural; with hi-fi stereo tapes, both channels are mixed.


System Example 2
Aerial
ANTENNEN-EINGANG
AUDIO/VIDEO
Rear
Audio/Video cable
HF-AUSGANG
Television
To AUDIO/VIDEO terminal
Aerial cable (provided)
To aerial terminal

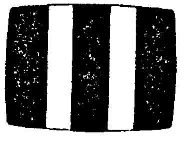
AV CONNECTION

- If your television is equipped with a 21-pin SCART connector, connect the recorder's AUDIO/VIDEO socket to the television's SCART connector.
- To view tape programmes via this connector, set the television to the AV mode.
- If your television is a stereo television, it is possible to play stereo tapes through the television's speakers.

Note:
For switching the television's input mode, refer to the instruction manual of your television.

VIDEO CHANNEL SETTING

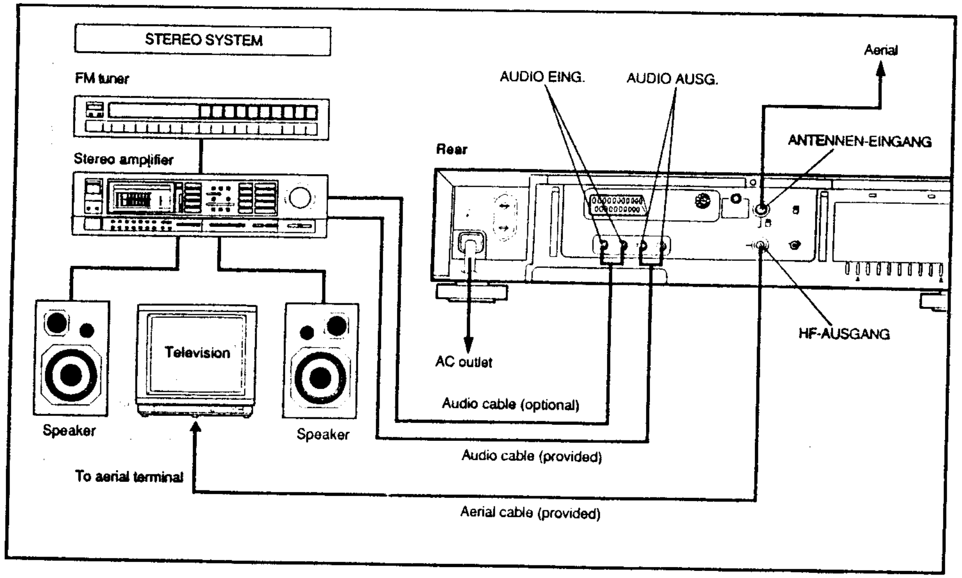
1. Press the BETRIEB button ① to turn the power on. Turn on the TV receiver.
2. Set the TEST switch ⑬ to EIN.
3. Adjust your TV receiver in the vicinity of UHF channel 36 until you bring in the two white signal bars on the screen as illustrated. This is your VIDEO CHANNEL.
4. Reset the TEST switch to AUS.



Notes:

- If some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel 36. Consult your JVC dealer for making this adjustment.
- Video channel setting is also possible using a prerecorded VHS video cassette. Play back the tape and tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.

TO A STEREO SYSTEM



Procedure

1. Connect the AUDIO EING. L and R connectors of the recorder to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck).
2. Connect the AUDIO AUSG. L and R connectors of the recorder to the AUX IN or TAPE MONITOR terminals of the amplifier.

CAUTION:

- This recorder has a dynamic range of more than 90 dB with regards to its hi-fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

Notes:

- Observe L and R when connecting the audio input and output connectors of the recorder to a stereo amplifier.
- If stereo or bilingual TV broadcasts are receivable in your area, this recorder can record them independently of the TV set and play them back through the connected audio system.
- When listening to sound from the connected stereo system, turn down completely the sound volume of the TV receiver.
- Listening to stereophonic sound is also possible using stereo headphones connected to the front panel KOPFHÖRER jack ⑭.
- With this setup, you can enjoy prerecorded Hi-Fi VHS video tapes in hi-fi stereo while viewing them on a regular TV receiver, and also you can record FM simulcast television programmes with hi-fi audio accompaniment. See page 58.
- If you want to timer-control the recording of FM simulcast programmes, connect the tuner's power cord to the recorder's AC outlet. Set the NETZAUSGANG switch ⑱ to EIN, and both the tuner and the recorder will be switched on at a time preprogrammed by the recorder. Timer-controlled recording of FM simulcast programmes is not possible with the type of tuners which reset the channel each time the power is switched off.

INFORMATION ON THE AUDIO SYSTEM

Hi-Fi and normal audio

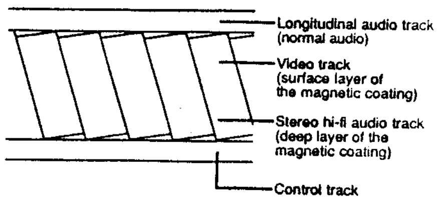
This recorder has two audio systems: Hi-Fi audio and normal audio. Hi-fi audio signals (2-channel) are recorded deep into the tape's magnetic coating of the video track section, while normal audio signals are recorded on the usual longitudinal track.

CAUTION:

- The hi-fi soundtrack recorded with this recorder cannot be reproduced with video equipment other than Hi-Fi VHS.
- The normal soundtrack is compatible with any VHS equipment.

Tape pattern recorded with this recorder

The Hi-Fi and normal soundtracks are recorded simultaneously


Longitudinal audio track (normal audio)
Video track (surface layer of the magnetic coating)
Stereo hi-fi audio track (deep layer of the magnetic coating)
Control track

Recording options according to the selected input mode

Track / Input mode	Video track	Normal audio track (mono)	Hi-fi audio track (2-channel)
TUNER SIMUL (button pressed to OFF)	TV picture (from built-in tuner)	TV sound (from built-in tuner)	TV sound (from built-in tuner)
SIMUL SIMUL (button pressed to ON)	TV picture (from built-in tuner)	TV sound (from built-in tuner)	Audio signal from AUDIO EING.
AUX AU Channel display section	Video signal from AUDIO/VIDEO	Audio signal from AUDIO/VIDEO (Mixing with microphone input is possible.)	

Notes:

- To engage the AUX mode, press the "0" key of the 10-digit keypad.
- Microphone input will be mixed with the audio signals on the hi-fi audio track only when the AUX mode is selected.
- You can record audio only (without recording any video signal) in either the SP or Hi-Fi LP mode. In the Hi-Fi LP mode you can enjoy up to 8 hours of hi-fi stereo recording with a single cassette (E-240).

Recording options according to the type of broadcasts and the setting of the 2-KANALTON HAUPT/NEBEN switch

Audio Track Type of broadcast	2-KANALTON HAUPT/NEBEN switch position	Normal audio track (mono)	Hi-fi audio track (2-channel)	
			L	R
Regular (monaural audio)	Either position	Mono	Mono	
Stereo broadcast	Either position	L + R mixed	Stereo	
Bilingual broadcast	HAUPT	Main soundtrack (local language)	Main soundtrack (local language)	Sub soundtrack (foreign language)
	NEBEN	Sub soundtrack (foreign language)		

Hi-Fi audio recording level adjustment

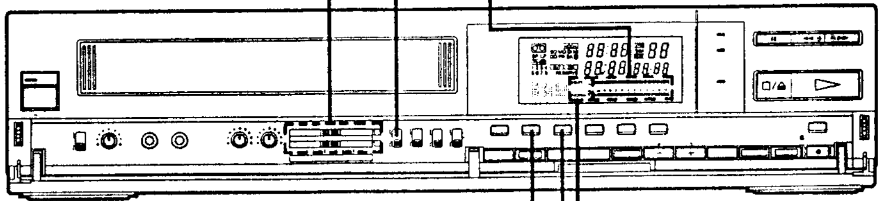
While recording onto the normal audio track is controlled by the built-in Automatic Level Control circuit, hi-fi audio recording has two control options: manual and automatic.

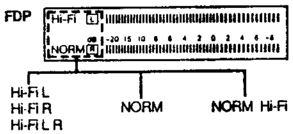
Hi-Fi AUFNAHMEAUSSTEUERUNG controls
Slide these controls, the upper for left channel and the lower for right channel, for manual adjustment of the Hi-Fi audio recording level.

AUDIO-BEGRENZER switch
Setting this switch to EIN activates the built-in audio limiter circuit for both channels so that the recording level is automatically controlled. For manual adjustment, set this switch to AUS. (The recording level for normal audio is always controlled automatically regardless of the setting of this switch.)

Audio level indicators
For manual control of the recording level, first set the relevant switch and button as follows:
AUDIO-BEGRENZER ⑳ → AUS
AUDIO MONITOR ㉕ → Hi-Fi L and R (Hi-Fi Stereo)
Then slide the Hi-Fi AUFNAHMEAUSSTEURUNG controls referring to these indicators. When indicators up to or near 0 dB light for the loudest signal being applied, the recording level is optimum. (The level at which only one red indicator lights from time to time may be most appropriate.) During playback, these indicators show the level of audio signals recorded on the tape.

Notes:
- With the AUDIO MONITOR and Hi-Fi/NORM/MIX buttons pressed so either Hi-Fi L or R or NORM indicator lights on the FDP, the recording level of hi-fi audio signals cannot be correctly indicated. Select both Hi-Fi L and R indicators when adjusting the recording level.
- The normal audio signal level is also displayed by these indicators, but cannot be adjusted.





Audio monitor indicators (HI-FI L, R, NORM)

Dual-audio playback flexibility

HI-FI/NORM/MIX button
Operates in conjunction with the AUDIO MONITOR button to select soundtracks for listening.
- When the power is turned on, both hi-fi channels can be listened to. Press this button once to listen to only the normal soundtrack (the NORM indicator lights).
- Press this button again to listen to a mixture of hi-fi stereo (Hi-Fi L and/or Hi-Fi R), and normal soundtracks, by selecting the combination with the AUDIO MONITOR button.

Notes:
- This button functions during recording as well, although it has no effect on the recorded signal.
- When playing back a tape containing the same soundtrack on both hi-fi and normal audio tracks, a slight time lag is sensed between the two soundtracks, probably with some distortion when listening in the Mix mode.

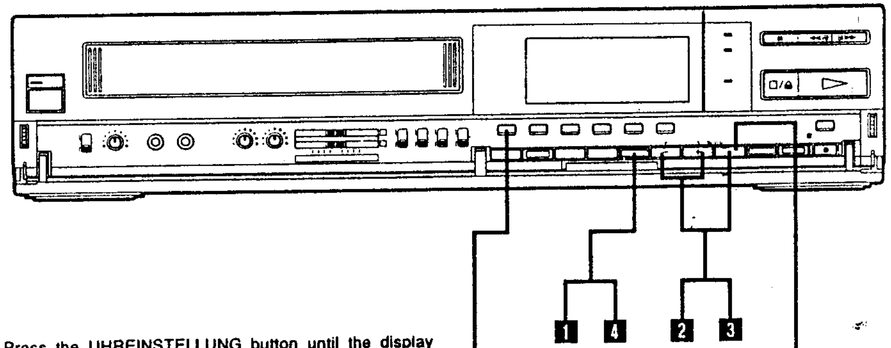
AUDIO MONITOR button
Selects the hi-fi audio channel (left, right or both) for listening. Use this button together with the Hi-Fi/NORM/MIX button referring to the four indicators (Hi-Fi, L, R and NORM).
- When the power is turned on, the Hi-Fi L and R indicators light and both hi-fi channels can be listened to. Press this button and only the Hi-Fi L indicator lights to listen to only the left hi-fi channel sound.
- Press this button again and only the Hi-Fi R indicator lights to listen to only the right hi-fi channel sound.

Notes:
- This button functions during recording as well, although it has no effect on the recorded signal.
- With the Hi-Fi/NORM/MIX button pressed for the NORM setting, pressing the AUDIO MONITOR button has no effect.

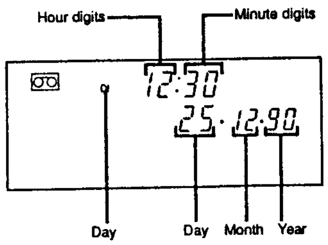
CLOCK SETTING

Setting the built-in clock

Plug the recorder into an AC outlet. The display shows a blinking 0:00.



1. Press the UHREINSTELLUNG button until the display shows the Clock Set mode with the hour indication blinking.
2. Set the hour and minute in that order by using the AUSWAHL and EINSTELLEN buttons alternately.
   - The blinking position is ready for entry.
   - Press EINSTELLEN until the correct indication appears in each position.
3. Set the day, month and year in the same way.
   - In year setting, set only the last two digits of the year.
4. Press UHREINSTELLUNG.
   - Press it at the exact instant of the time signal, and the clock will be set accurately to the present time.
   - The day-of-the-week indication will be displayed automatically.



Notes:
- Clock setting is not possible in the timer recording standby mode. First check to see that the TIMER indicator on the FDP is not lit.
- Enter the data within 10 seconds after pressing the UHR-EINSTELLUNG button.

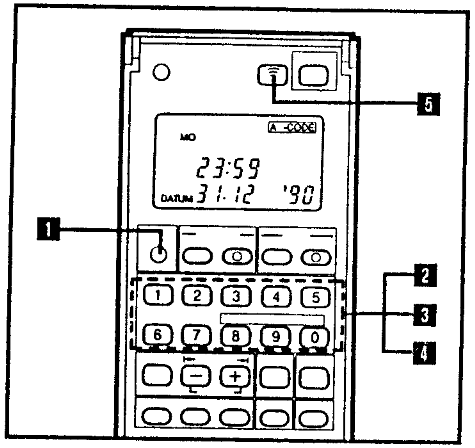
SUMMER TIME ADJUST
This convenient feature is for quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later.
1. Simply press and quickly release the SOMMERZEIT EINST. button in the Clock Set mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SOMMERZEIT EINST. button pressed for 2 seconds to set the clock back by an hour.

DISPLAY OFF
Press the ANZEIGE AUS button to make all indications on the FDP disappear when they are not required; the display will show "– : –". Press again to make the clock display reappear.

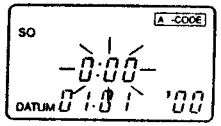
Power failure indicator
The blinking 0:00 (initial condition of the display) is also a power failure indicator, showing that there has been a power failure in excess of 3 minutes. Readjusting the time restores the normal condition of the clock display.

Setting the LCD clock of the remote control unit

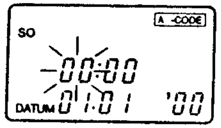
The LCD clock is independent of the recorder's clock.
The recorder's clock can be adjusted from the remote control unit if its transfer function is used.



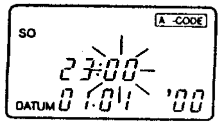
Insert two "R6"-size batteries (provided) into the remote control. The LCD shows the following with "0:00" blinking.



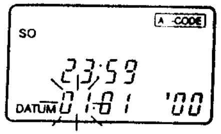
1 Press the UHREINSTELLUNG button.
- The hour indication will blink.



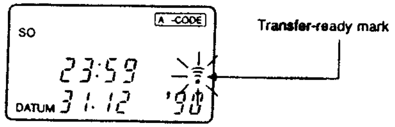
2 Press the numeric key corresponding to the current hour, then the minute indication will blink.
- Always key in two digits.
  For a one-digit number, key in "0" first.



3 Key in the digits corresponding to the current minute, then the day position of the DATUM indication will blink.



4 Key in the digits for the day, month and year in succession.
- In year setting, set only the last two digits of the year.
- After setting the year, the transfer-ready mark will appear and blink.



5 Press the ÜBERTRAG button at the exact instant of the time signal.
- The day-of-the-week indication will be displayed automatically.
- The clock of the remote control will be set accurately to the second and, at the same time the set data will be transferred to the clock of the recorder.
- When it is not necessary to transfer the clock data to the recorder, press the UHREINSTELLUNG button instead of the ÜBERTRAG button to set the remote control's clock.
- If the transfer-ready mark disappears before transmission, press the UHREINSTELLUNG button to make it reappear, then press the ÜBERTRAG button while the transfer-ready mark is blinking; otherwise, the ÜBERTRAG button will function as a summer time adjust button.
- If the clock has already been set, the transfer-ready mark starts blinking when the UHREINSTELLUNG button is pressed.
- To transfer the data to the recorder's clock, simply press the ÜBERTRAG button.
- To readjust the clock, press the UHREINSTELLUNG button and then press either CURSOR ⊢—/—⊣ button so that the position which requires correction blinks.

SUMMER TIME ADJUST

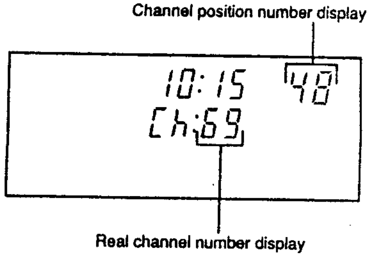
For quickly making the annual clock adjustment to the "summer time" (daylight saving time) setting, and back to regular time later, use the SOMMERZEIT EINST. button ②.

1. Simply press and quickly release the SOMMERZEIT EINST. button in the Clock mode to set the clock forward by one hour.
2. Later in the year, to switch back to regular time, simply hold the SOMMERZEIT EINST. button pressed for more than 2 seconds to set the clock back by an hour.

Note:
- For summer time adjustment, make sure that the transfer-ready mark is not on the LCD.

OPERATING THE BUILT-IN TUNER

This recorder incorporates an advanced frequency synthesized tuner which is pretuned to 91 channels to cover VHF, UHF and CATV broadcasts. Channel indication is given in two different ways: real channel numbers and channel position numbers. Real channel number indication is available by pressing the VPS/KANAL-EINSTELLUNG button ● or ⑭, or during search by pressing the SUCHLAUF button ●, while channel position number indication is always available in the channel display.



Correspondence between 91 pretuned TV stations and the recorder's real channel indications

DISPLAY	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
VHF	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11 (H1)	E12 (H2)	A	B	C	D	E	F	G	H
DISPLAY	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
UHF	E21	E22	E23	E24	E25	E26	E27	E28	E29	E30	E31	E32	E33	E34	E35	E36	E37	E38	E39
DISPLAY	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
UHF	E40	E41	E42	E43	E44	E45	E46	E47	E48	E49	E50	E51	E52	E53	E54	E55	E56	E57	E58
DISPLAY	59	60	61	62	63	64	65	66	67	68	69								
UHF	E59	E60	E61	E62	E63	E64	E65	E66	E67	E68	E69								
DISPLAY	75	76	77	78	79		81	82	83	84	85	86	87	88	89	90	91	92	93
CATV	X	Y	Z	—	—		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
DISPLAY	94	95	96	97	98	99	00												
CATV	S14	S15	S16	S17	S18	S19	S20												

Stored channels

A total of 91 channels are receivable. Of them, up to 48 can be stored for easy channel selection. Prior to shipment, some channels are stored.

It is possible to store more channels or skip some channels if there are no broadcasts on those channels in your area. It is possible to change the stored channels to correspond to your preferred channel allocation. Skipped channels can be restored whenever necessary.

- Channel memories are permanent; the programmed channel allocation will not be erased even if the recorder is unplugged from the AC outlet.

Channel selection

To select a channel for recording, normally use the KANAL buttons ● (㉝ on the remote control) or 10 numeric keys ⑩. You can choose any channel from among the stored ones by calling up the corresponding channel position number.

- Use the "∨" button to scan to a channel in the direction of decreasing numbers; the "∧" button, in the direction of increasing numbers.
- An invalid number larger than 48 will be rejected.

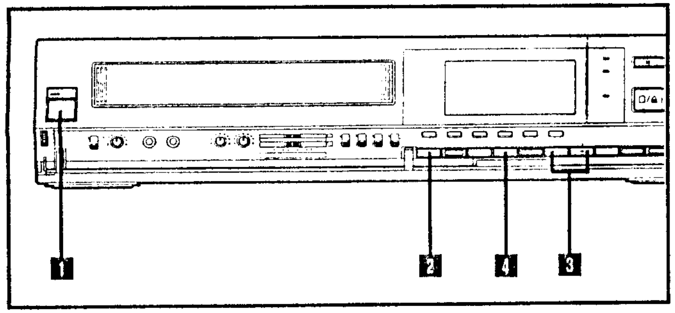
If you want to select a channel other than those stored, engage the Real Channel mode and call up a channel, while referring to the real channel number display.
With recorder's controls:
- Simply press the SUCHLAUF button ●.

With remote control
- Press the VPS/KANAL button ⑭ to engage the Real Channel mode and call up a channel by using the 10 numeric keys. For details, refer to the next page.

Storing channels

TV receiver

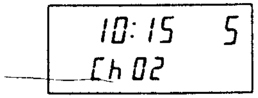
Switch on the TV receiver.
- Set the TV receiver to your video channel or to the AV mode (depending on the connection).



A. Automatic Setting

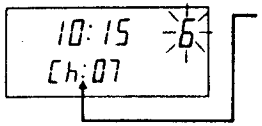
1 Turn the power on.
- The display will change from the Date mode to the Counter mode.

2 Press the SUCHLAUF button.
- The display will change to the Real Channel mode and automatic scanning will take place.
- Reverse search will be engaged if the SUCHLAUF button is kept depressed.



VHF channel 2 is stored for channel position 5.

- When a broadcast is detected, scanning stops automatically and the displayed channel position number will blink.



"Colon" will appear to indicate that this real channel is not stored for the indicated channel position.

3 Select a channel position into which you wish to store that station by using the KANAL buttons while the channel position number is blinking.

4 After confirming the real channel number and channel position number, press the SPEICHERN button.
- The Channel position number stops blinking.
- "Colon" will disappear and the selected station has been stored.

B. Manual Setting from remote control unit

(1) Press the VPS/KANAL button ⑭.
- The display will change to the Real Channel mode.

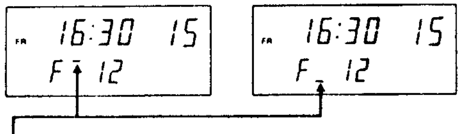
(2) Press VPS/KANAL until the real channel number starts blinking.
- Blinking will stop in 10 seconds.

(3) Enter the number of a real channel to be preset.
- The channel position number will start blinking.

(4) Select a channel position into which the selected real channel is to be stored, using the 10-digit keypad.
- Depress the numeric key for the second digit continuously until blinking stops. This enables the entered number to be stored.
- The display will return to the clock mode by simply keying in the channel number to be viewed.

• Fine Tuning

For fine tuning, press the AUSWAHL button ⓱ in step 3 (both in automatic and manual setting) and use the FEIN "+" or "_" button ⓰; "+" to fine-tune in the direction of increasing frequencies, and "–" to fine-tune in the direction of decreasing frequencies.



Upper or lower "-" sign indicates the operating tuning frequency is above or below the standard broadcast frequency.
Center "-" sign will appear when it corresponds to the standard.

Skipping the stored channels

1. Call up the channel position number that you wish to skip by using the KANAL buttons ⓴ or 10 numeric keys ⑩.
2. Press the VPS/KANAL-EINSTELLUNG button ⓯.
3. Press the SPRINGEN button ⓳.
   - "Colon" will appear to indicate that the displayed real channel is not stored.
   - The skipped channel number will not appear on the channel display during up/down scan tuning.

Note:
If no command is given after each step of the setting operation, the Real Channel mode will be automatically cancelled in 10 seconds.

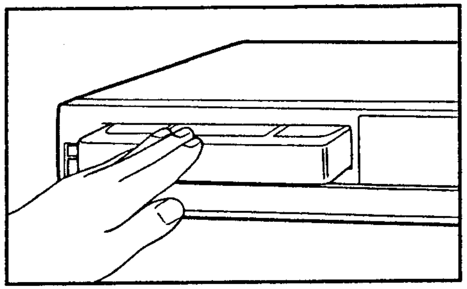
LOADING AND UNLOADING A CASSETTE

Motorized Loading System
- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- The cassette can be unloaded even when the power has been turned off. If a cassette is inside, pressing the CASSETTE button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

Auto-Play System
- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

LOADING

Insert a cassette as illustrated with its labelled side facing you.
- With a cassette inserted, the"[ꝏ]" indicator appears on the FDP.
- The counter resets automatically when a cassette is inserted.



Notes:
- Be sure to insert the cassette firmly into the slot; otherwise it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

UNLOADING

Press the STOP/CASSETTE button ❺in the Stop mode.

Caution
- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the SCHALTUHR button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.

WARNING
- Do not insert fingers or any foreign object beyond the door flap of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

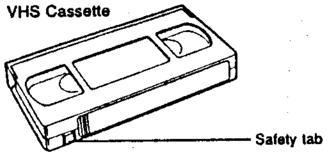
USABLE CASSETTES AND THEIR RECORDING TIME

Both regular VHS and S-VHS cassettes can be used with this video recorder for recording. However, only regular VHS recordings can be made and played back on this video recorder. S-VHS recordings can neither be made nor played back on this video recorder.

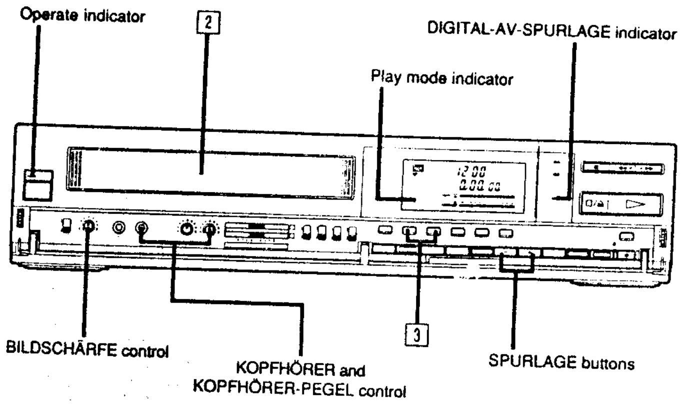
Type of Cassette	Recording/Playback Time	
	SP (Standard Play)	Hi-Fi LP (Long Play mode for Hi-Fi audio)
E-30	30 minutes	1 hour
E-60	1 hour	2 hours
E-90	1 hour, 30 minutes	3 hours
E-120	2 hours	4 hours
E-180	3 hours	6 hours
E-240	4 hours	8 hours

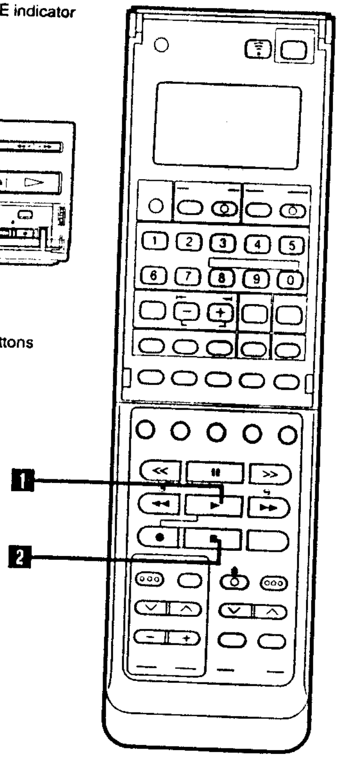
ACCIDENTAL ERASURE PREVENTION

- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



PLAYING BACK A VIDEO CASSETTE





PREPARATION

1. Switch on the TV receiver.
   - Set the TV receiver to your video channel or to the AV mode (depending on the connection).
2. Load a pre-recorded cassette.
   - Power will be switched on automatically.
   - When a cassette with its safety tab removed is loaded, playback starts automatically.
3. Make the AUDIO MONITOR [illegible] and Hi-Fi/NORM/MIX [illegible] setting as required. (See page 48.)

DIGITAL AV TRACKING SYSTEM

This recorder incorporates a digital AV tracking system for automatic tracking adjustment. In most cases you do not have to adjust the tracking.

- When you start playback after inserting a tape, the digital tracking system automatically adjusts the tape path relative to the heads to obtain the best possible pictures and Hi-Fi stereo sound.
- If there is no recorded Hi-Fi audio, tracking is set referring only to the video signal. The audio output is automatically switched to normal audio.
- This automatic tracking adjustment also takes place when the playback output level reduces below a certain level.
- The DIGITAL-AV-SPURLAGE indicator blinks while the system is searching for optimum tracking, and remains lit as long as the automatic tracking mode continues.

If automatic tracking fails, and some noise bars are visible on the screen, use the manual tracking mode.

- Press both SPURLAGE "+/-" buttons simultaneously to cancel the automatic mode, then press either button to move noise bars out of the screen.
- To return to the automatic mode, press both buttons simultaneously.

OPERATING PROCEDURE

1. Press the ► button.
2. Press the ■ button at the end of the programme.

Notes:

- For various convenience facilities and special-effects features available during playback, see the next two pages.
- The tape-end auto-rewind mechanism functions in the Play, Fast Forward and Forward Search modes.
- When listening through headphones, if the volume is too low or too high, adjust the KOPFHÖRER-PEGEL control for comfortable listening.

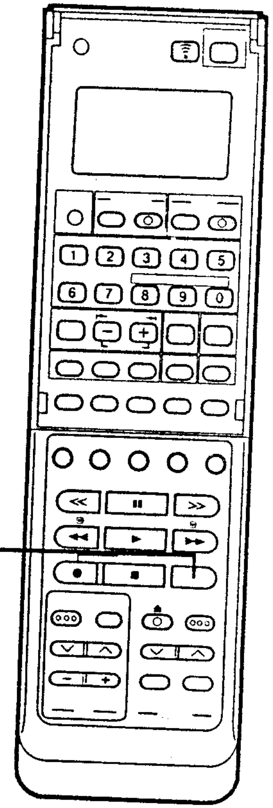
PICTURE SHARPNESS ADJUSTMENT

Images on the screen can be adjusted to a preferred softer or sharper definition by turning the BILDSCHÄRFE control in the corresponding direction.

CONVENIENT FACILITIES RELATED TO PLAYBACK

SKIP SEARCH

During playback, press the SPRING./BLANK SUCHL. button from 1 to 4 times to skip through 30-sec. to 2-min. sections of tape. Playback resumes automatically. Press the ► button to cancel the Skip Search mode midway.



MEMORY PLAY

If you want to watch the tape from its beginning after rewinding, you do not have to wait for completion of rewind to press the ► button.

- Press the ◄◄ button and then ► button within 2 seconds. Playback will start automatically at the beginning of the tape. (Check to see that the counter memory indicator [S] is off).

  If you want to watch the tape from the counter reading of "0St 00M 00S", press the Z.-SPEICHER button to obtain [S]. Then, press the ◄◄ (or ►►) button and the ►.
- While the tape is being rewound, the Play (▷) indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (■, ►, ►►, ◄◄).

More Next-Function Memory Features

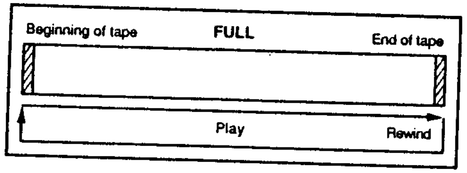
If you are going to eject the cassette, or turn the power off after rewinding the tape, press the CASSETTE or BETRIEB (VIDEO) button within 2 seconds after pressing the ◄◄ button.

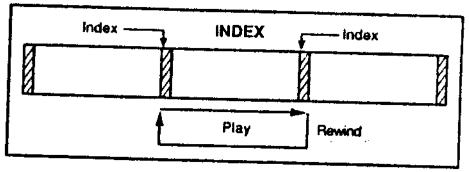
Note:

- For various tape access methods that can be used in different applications, refer to pages 64 and 65.

REPEAT PLAYBACK — FULL REPEAT OR INDEX REPEAT

This function allows you to set the video recorder for repeated playback (5 times) of the entire tape ("KOMPL.") or repeated playback (5 times) of a segment of the tape from one index mark to the next ("INDEX").



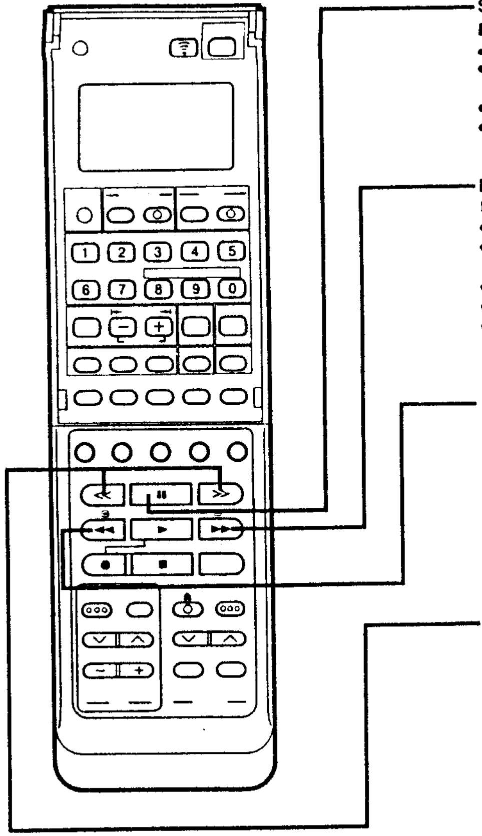


1. Set the WIEDERHOLUNG switch [illegible] as required.
2. With the switch in the INDEX position, you can designate the segment using the Index Search mode or Index Mark function. (See page 65).

Note:

After repeat playback, be sure to reset the WIEDERHOLUNG switch to "AUS".

SPECIAL-EFFECTS PLAYBACK



STILL PLAYBACK AND FRAME ADVANCE

II button

- To view a still picture, press this button in the Play mode.
- To advance the picture frame by frame, press this button again.
- To return to normal playback, press the ► button.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.

HIGH-SPEED FORWARD SEARCH

►► button

- To fast forward the tape, press this button in the Stop mode.
- To shuttle search the tape in the forward direction, press this button in the Play mode.
- The shuttling speed is about 9 times normal.
- Press the ► button to return to normal playback.
- For briefer scanning, keep the button pressed for more than 2 seconds; when you release the ►► button, the Search mode will be cancelled.

HIGH-SPEED REVERSE SEARCH

◄◄ button

- To rewind the tape, press this button in the Stop mode.
- To shuttle search the tape in the reverse direction, press this button in the Play mode.
- The shuttling speed is about 9 times normal.
- Press the ► button to return to normal playback.
- For briefer scanning, keep the ◄◄ button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.

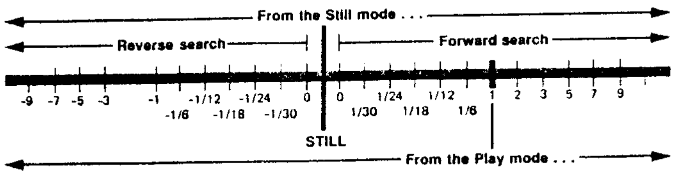
VARIABLE-SPEED SEARCH AND SLOW MOTION

Variable search buttons (<</>>)

The variable search buttons control both the direction and speed of tape search, making possible fast- and slow-motion playback in either forward or reverse direction from either the Still or Play mode.

Operation tips:

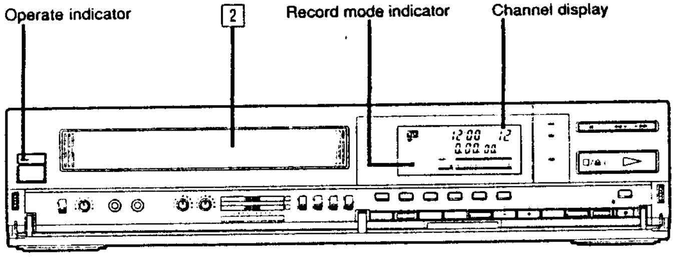
- To increase speed while in the forward direction, press >> repeatedly; to decrease, press << repeatedly. The direction reverses after leaving the Still mode.
- To increase speed while in the reverse direction, press << repeatedly; to decrease, press >> repeatedly. The direction reverses after leaving the Still mode.
- To return to normal playback, press the Play button.

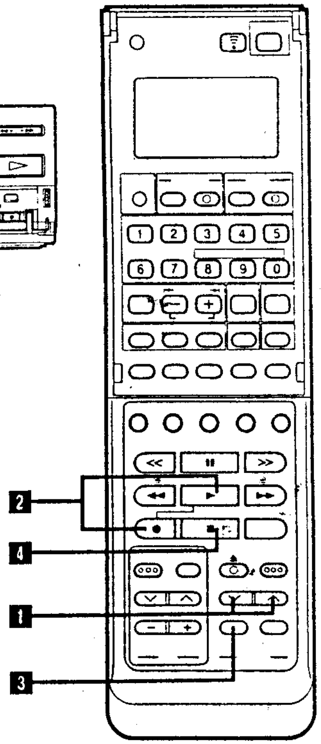


Notes:

- With some televisions, the still picture may be unstable. If vertical vibration of the picture is observed, attempt to correct it by pressing the V-BILD buttons.
- *If noise bars are visible in the Special-Effects Playback mode*, attempt to correct it in the manual tracking mode as described on page 54.
- No audio is available during any special-effects playback mode.

BASIC OPERATION FOR RECORDING TV PROGRAMMES





PREPARATION

1. Switch on the TV receiver.
   - Set the TV receiver to your video channel , or to the AV mode (depending on the connection).
2. Load a cassette (with safety tab in place). Power will be switched on automatically.

OPERATING PROCEDURE

1. Select the channel you wish to record with the KANAL ∨/∧ buttons.
2. Press the ● and ► buttons simultaneously to start recording. "INDX" will appear on the FDP and blink to show that an index code is being recorded. (When using the video recorder's front panel control buttons, press AUFN./DA once to start recording.)
3. Normally leave the SP/Hi-Fi LP button set to the SP mode ("SP" lights on the FDP).
   - In the Hi-Fi LP mode only sound can be recorded — up to 8 hours with an E-240 cassette. (Pictures cannot be recorded in the Hi-Fi LP mode.)
4. Press the ■ button at the end of the programme.

RECORDING ONE TV PROGRAMME WHILE WATCHING ANOTHER

A programme not being viewed can be recorded while you enjoy viewing another programme.
This permits the recorded programme to be played back later at your convenience.

The key points to remember are:

- Select the channel you wish to record with the recorder's channel selector.
- Select the channel you wish to view with the TV receiver's channel selector.

Notes:

- If the AUFN./DA button is pressed more than once, the Instant Timer Recording mode will be entered (see page 60). To return to ordinary recording, repeatedly press the AUFN./DA button until the AUT indicator on the FDP extinguishes.
- If there is part of the programme you do not want to record, press the II button. To release the Pause mode. Press the ► button.
- When recording is restarted from the Record-Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point. A few frames recorded before the pause may be erased due to overlap of the new recording. This is not due to any defect of the unit.
- When the Record-Pause mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- If the ● button cannot be engaged, check to see if the cassette safety tab has been removed. (See page 53).
- When the end of the tape is reached during recording, the tape is automatically rewound to the beginning and stops.
- The built-in tuner's automatic channel lock mechanism prevents the selected channel from being altered during recording. Therefore, if you wish to change the channel during recording, first engage the Record-Pause mode and then select a different channel.

OTHER RECORDING POSSIBILITIES

RECORDING STEREO TV PROGRAMMES

If stereo TV programmes are broadcast in your area, this recorder automatically receives them in stereo. When a stereo programme is being received, the STEREO indicator lights and recording is made in stereo on the hi-fi audio track and in monaural (mixed L and R) on the normal audio track. To listen to the stereo soundtrack during recording, set the AUDIO MONITOR button ㉓ ㉒ for Hi-Fi L and R. If this button is left set either in the Hi-Fi L or R position, you will hear only one channel while recording, though the recording is being made in stereo.

- If the quality of the stereo sound being received is poor, set the MONO/AUTO switch ㉘ to MONO. The STEREO indicator will go off, and the broadcast will be received in monaural with better quality.

RECORDING BILINGUAL TV PROGRAMMES

When a bilingual TV programme is being received, the 2-KANAL indicator lights. There is a switch to select the soundtrack to be recorded on the normal audio track, however, because both soundtracks are recorded always on the hi-fi track for selective listening, you can ignore the switch labelled 2-KANALTON HAUPT/NEBEN in most cases unless you need a special soundtrack on the normal audio track.

- Set the 2-KANALTON HAUPT/NEBEN switch ㉑ to HAUPT to record the main soundtrack (local language); to NEBEN to record the sub soundtrack (foreign language).
- To listen to the selected soundtrack from the hi-fi audio track while recording, press the AUDIO MONITOR button for either Hi-Fi L or R.
- To listen to the soundtrack being recorded on the normal audio track, press the Hi-Fi/NORM/MIX button ㉕ for NORM.

RECORDING FM SIMULCAST TV PROGRAMMES

FM simulcast TV programmes can be recorded using an FM stereo tuner. Connect necessary components. (Connect the FM tuner to the rear panel AUDIO EING. connectors.) Select the TV channel broadcasting the simulcast programme with the recorder's channel select buttons and tune the FM stereo tuner to the station broadcasting the soundtrack for that TV programme.

The only difference from the basic recording procedure on page 57 is an additional step.

- Press the SIMUL button ㉗.

Then the SIM indicator on the FDP will light. With this setting, the video and audio signals from the built-in tuner will be recorded on the video and normal audio track, and the audio signal from the FM stereo tuner will be recorded on the hi-fi audio track.

Notes:

- After finishing recording, be sure to press the SIMUL button to switch back to the Tuner mode.
- While recording simulcast programmes, it might happen that the hi-fi sound distorts momentarily at switching points between different programmes. This is not due to any defect of the unit.

RECORDING A TV PROGRAMME WHILE RECORDING AN INDEPENDENT AUDIO SOURCE

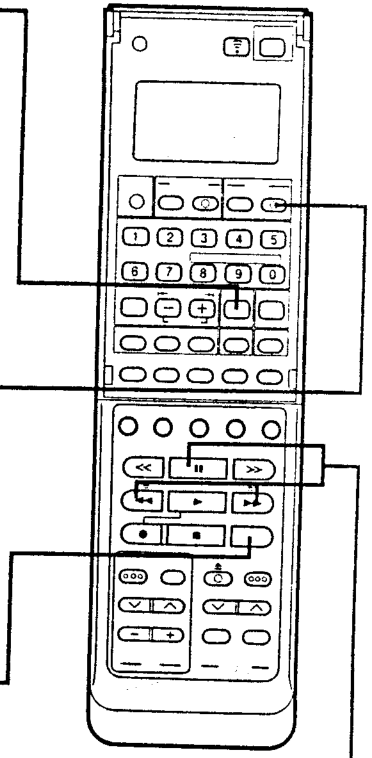
Using the "simulcast" recording function, you can record independent audio and video programmes, because the TV soundtrack is not lost, but recorded on the normal audio track. While recording a TV programme, record any audio source independently.

- Connect an audio component (such as an FM tuner) to the AUDIO EING. connectors (51).
- Press the SIMUL button. The SIM indicator on the FDP will light.

Notes:

- If you stop recording to avoid unwanted material of the TV programme using the PAUSE/STANDB. button, the audio programme from an external source is also cut.
- If television broadcasting comes to an end during recording, the hi-fi sound being recorded from an external source may distort. It is recommended that you check the timetable of TV broadcasts in advance.
- After finishing recording, be sure to press the SIMUL button to switch back to the Tuner mode, otherwise recording on the hi-fi audio track from the built-in tuner will not be possible.

CONVENIENT FACILITIES RELATED TO RECORDING



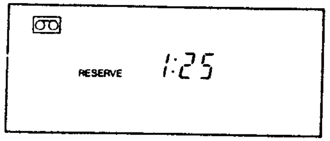
REMAINING TAPE TIME INDICATION

The tape counter can be switched to display the remaining tape time.

- Press the ANZEIGE button to obtain the remain (RESERVE) tape time indication in hours and minutes on the FDP.

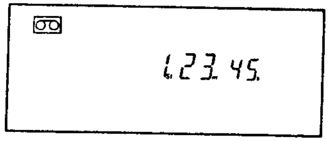
Note:

- The indicated remaining time is approximate.



ELAPSED RECORDING TIME INDICATION

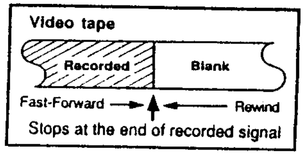
When you need to know the exact time of a recording, press the Z.-RÜCKST. button before starting recording or playback. The counter will be reset to "0St 00M 00S" and show the exact elapsed time as the tape runs.



BLANK SEARCH

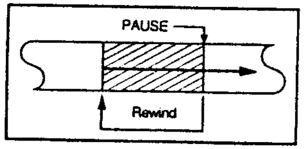
When you want to record a new programme on a partially recorded tape, use this function to automatically locate the end of a recorded section. Even when a fully recorded tape is used for re-recording new material, this system can be used to detect the end of the newly-recorded material.

- Insert a cassette and press the SPRING./BLANK SUCHL. button.
- If a recorded signal is present, the recorder automatically enters the Fast Forward mode, and stops automatically around the end of that recorded section. Before starting recording, play back the tape to determine where to start a new recording.
- If the SPRING./BLANK SUCHL. button is pressed where no signal is recorded, the recorder automatically enters the Rewind mode, searches for the end of the preceding recorded segment, and stops.
- When the SPRING./BLANK SUCHL. button is pressed, the tape counter is automatically switched to the RESERVE mode and shows the remaining tape time in hours and minutes. To switch back to the realtime counter mode, press the ANZEIGE button.



RETAKE FUNCTION

While in the Record-Pause mode, pressing the ►► or ◄◄ button initiates normal-speed search in the corre-sponding direction. Releasing the button engages the Record-Pause mode. If you have recorded unnecessary material because of having engaged the Record-Pause mode too late, use this function to return to the position where you want the next recording to start. Then, simply press the ► button when you want to re-start recording.



Note:

- Rainbow noise may occur in the rewound and re-recorded section.

24-HOUR TIMER

The 24-Hour Timer Recording feature allows unattended automatic starting and stopping of the recording of a single programme which starts within a 24-hour period.

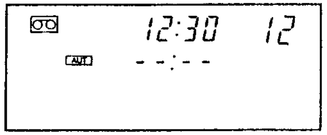
Preparation

1. Insert a cassette with its safety tab in place. The recorder turns on automatically.
2. Select the channel you wish to record from.

Setting the timer

1 Press the START button ⊕ to engage the 24-Hour Instant Timer Set mode. The following appears on the FDP with the current time.

FDP



- Each pressing delays the START time by 30 minutes
- For a more precise time setting, use the AUSWAHL and EINSTELLEN buttons.

2 After reaching the desired START time, press the AUFN./DA button the required number of times to set the desired length of recording time.

- For a more precise time setting, use the AUSWAHL and EINSTELLEN buttons.

3 After confirming the START time and recording length, press the BETRIEB button.

- "AUT" remains on the FDP and the 24-Hour Instant Timer Standby mode will automatically engaged.
- If the programme has not been correctly preset, the "AUT" indicator will blink for about 10 seconds when the BETRIEB button is pressed. Recheck the programmed data.

Notes:

- At each step of the timer setting procedure, if no data is entered within 10 seconds, the 24-Hour Timer Set mode is cancelled, and the current time is displayed.
- To cancel the 24-Hour Timer Set mode, press the LÖSCHEN button once or twice depending on the setting status.
- 24-Hour Timer Recording has priority over other timer programme settings; therefore, no other programmes, set for timer recording, will be recorded until 24-Hour Timer Recording has been executed.

OFF-TIMER

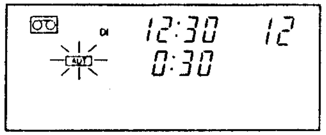
- Start recording as described on page 57.

After you start recording, the recorder can be set to stop automatically after a certain period of time. Use this facility for starting a recording before you go to bed or leave home.

1 Press the AUFN./DA button while recording (or twice if in the Stop mode).

- The following indication will appear on the FDP, to show that the recorder is recording in the Instant Timer Recording mode and power will switch off after 30 minutes.

FDP



2 Each time the AUFN./DA button is pressed, recording time increases by 30 minutes to a maximum of 4 hours. If the AUFN./DA button is pressed again, the Normal Recording mode will be entered.

- For a more precise time setting, use the AUSWAHL and EINSTELLEN buttons to set to the exact time required (possible up to 8 hours and 59 minutes).

Notes:

- While recording is in progress, the displayed time counts down; when 0:00 is reached, the Record mode is released after 10 seconds and the power is switched off.
- If you want to stop recording after having started recording in the Instant Timer Record mode, press the STOP/CASSETTE button.
- If instant timer recording is engaged while the unit is in the Pause mode, the timer will count down normally, but recording will not begin until the WIEDERG. button is pressed.
- When the Instant Timer Record-Pause mode continues for longer than 5 minutes, the mode is released and power is switched off.
- If you want to check the elapsed time (Realtime Counter reading) on the FDP while performing Instant Timer Recording, press the ANZEIGE button to obtain the desired indication. After about 5 seconds, the indicator will return to the AUT mode and the remaining time indication will reappear automatically.

First of all, load a cassette (with safety tab in place); power will be switched on automatically.

Three ways to perform timer programming

A. **Local programming:** Programme the timer using the recorder's controls while referring to the recorder's FDP.

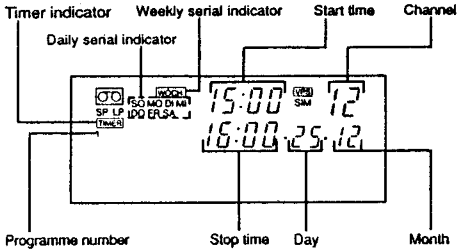
B. **On-screen remote programming:** Programme the timer using the remote control's keys while referring to the on-screen display.

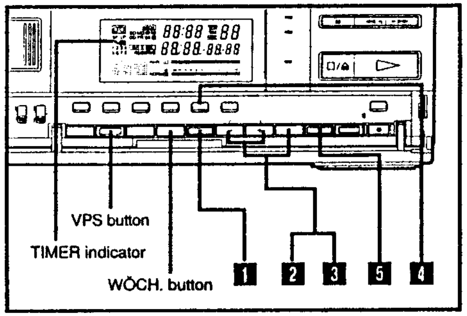
C. **Independent remote programming:** Programme the remote control's memory using the remote control's keys while referring to its own LCD and then transfer the data to the recorder anytime at your convenience.

A. Local Programming

1 Press AUFZ. NR. button.

- The display will change to the Timer Set mode for programme number "1". To advance to programme numbers 2 — 8, press either EINSTELLEN button a required number of times.
- By pressing the remote control's BILDSCHIRM KONTROLLE button while the FDP is in the Timer Set mode, the on-screen display is also available.





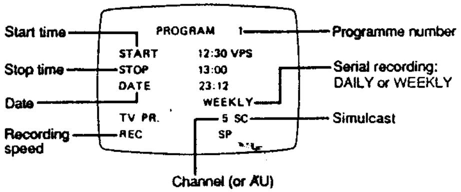
2 [2] Set the start time by using the AUSWAHL button and the EINSTELLEN buttons.

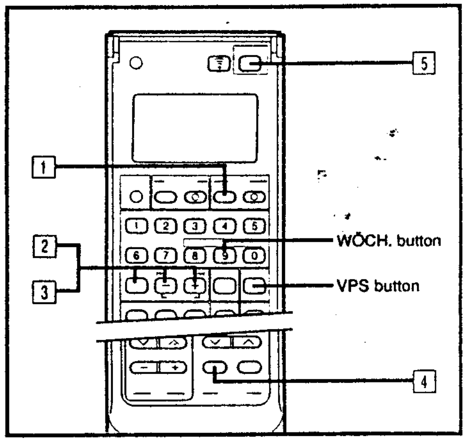
- Select the item to be set with the AUSWAHL button; the selected item will blink.
- Set the desired data with the EINSTELLEN –/+ buttons.
- To record a weekly serial, press the WÖCH. button once.
- To record a daily serial starting on a certain day, press WÖCH. twice.

B. On-Screen Remote Programming

[1] Press the VIDEO AUFZ. NR. button.

- The TV screen will change to the Timer Set mode for programme number "1" in one of the selected languages. (For language selection, see page 44.) To advance to programme numbers 2 — 8, press either EINSTELLEN button a required number of times.





3 [3] Set the stop time, date and channel in succession in the same way as for setting the start time.

- To record a daily serial starting on the day of setting, there is no need to enter any date figure; simply advance to the next item.
- When not using the VPS recording system, before setting the channel, press the VPS button to make "VPS" disappear.
- For programming the timer to record an external source, while the channel position is blinking, press EINSTELLEN –/+ until the "AU" indicator appears in the channel display section.

4 [4] Normally leave the SP/Hi-Fi LP button set to the SP mode ("SP" lights on the FDP).

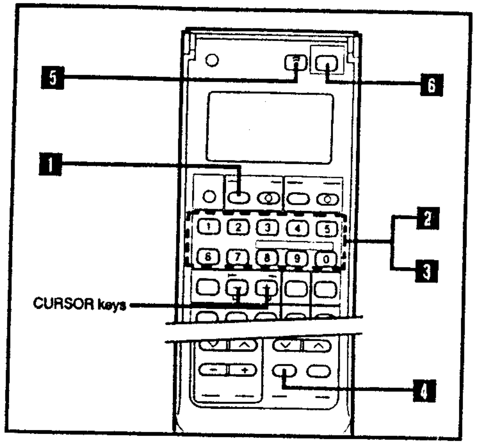
- In the Hi-Fi LP mode only sound can be recorded — up to 8 hours with an E-240 cassette. (Pictures cannot be recorded in the Hi-Fi LP mode.)

5 [5] After making sure that the cassette is loaded, press the SCHALTUHR button.

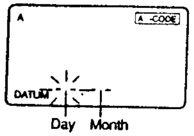
- The Timer Recording Standby mode will be engaged with the TIMER indicator and the preset programme number(s) illuminated and the power turned off.
- With no cassette loaded, the TIMER and "cassette loaded" indicators will continue blinking.
- A cassette whose safety tab has been removed will be ejected automatically.
- If a preset programme contains errors, the programme number will not illuminate. Recheck the programmed data.

C. Independent Remote Programming

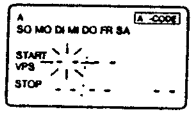
- The remote control incorporates 4 programme memories (A, B, C and D).
- The programmed data is held in memory even after it has been transferred to the recorder.



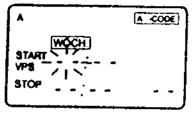
1 Press the SPEICHER AUFZ. NR. button.
- The LCD will be activated for programmè memory "A".
- To advance to programmes B to D, press again.



2 Enter the date using the numeric keys.
- Invalid numbers will be rejected.
- To record a daily serial starting on the day of setting, press the CURSOR key "—⊣" without entering any date figure.
- To record a daily serial starting on a certain day, press [⇓] and enter the date.
- To record a weekly serial, press [⇓] and enter the date.

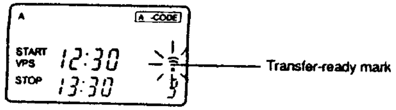


For daily serial setting



For weekly serial setting

3 Enter the start time, stop time and channel in succession.
- To key in a one-digit number of hours or minutes, first press [0]. Then press the relevant numeric key.
- When not using the VPS recording system, before setting the channel, press the VPS button to make "VPS" disappear.
- For programming the timer to record an external source, press the numeric key "0" while the channel is blinking; "AU" will appear on the LCD. When transferred in step **5**, "AU" will appear in the channel display section on the FDP.
- After the channel has been entered, the transfer-ready mark will appear and blink.



4 Normally leave the SP/Hi-Fi LP button set to the SP mode ("SP" lights on the FDP).
- In the Hi-Fi LP mode only sound can be recorded — up to 8 hours with an E-240 cassette. (Pictures cannot be recorded in the Hi-Fi LP mode.)

5 Direct the remote control to the recorder's Remote Sensor window and press the ÜBERTRAG button.
- The programmed data will be loaded in one of the recorder's memories (1— 8), the vacant one of the smallest programme number.
- If all programme memories are full, the recorder's clock will blink and transmission will not take place.
- Call up the programme(s) to be cancelled by pressing the VIDEO AUFZ. NR. button, then press the VIDEO LÖSCHEN button to cancel it. Data transfer can now be made by pressing ÜBERTRAG again.

6 Press the SCHALTUHR button.
- Check to see that the TIMER indicator appears on the FDP.

How to use the CURSOR keys (⊢—/—⊣)
- If you press a wrong key and the blinking position has advanced, press ⊢— to return to the previous position for correction.
- Once all data have been programmed, you can reach any position for correction using ⊢— or —⊣. The blinking position is ready for re-entry.
- Pressing the SPEICHER AUFZ. NR. button on the remote control, engages the LCD in the transfer-ready mode in which the transfer-ready mark is blinking and data correction is not possible. For correction of data, press either cursdr key to move to the position which requires correction.

Setting the date, start and stop times, and channel

- It is not possible to set the date, start and stop times unless the date and clock have previously been set.
- Enter the data while the digits are blinking.
- The stop time can be set within 24 hours of the start time.
- Non-applicable numbers (such as January 32, February 30 for dates, 24 or larger for hours, 60 or larger for minutes and 49 or larger for channels) will be rejected when keyed in.

Cancelling the preset data

- The preset programmes can be cancelled. First disengage the Timer Standby mode and engage the Timer Set mode for the programme number you wish to cancel and then press the LÖSCHEN button ● or the VIDEO LÖSCHEN button. Or for the remote control's memory, press the SPEICHER LÖSCHEN button.
- An executed programme is automatically cleared.

Checking the programmed data

- Checking can be performed anytime, even after the SCHALTUHR button has already been engaged. To do this, press the AUFZ. NR. button ● while in the Timer Standby mode. The programme number will blink on the FDP and you can check each programme by advancing programme numbers with the EINSTELLEN buttons ●. If re-programming is required, disengage the Timer Standby mode and use the regular programming method. Pressing the AUFZ. NR. button and/or EINSTELLEN buttons engages the FDP in the check mode in which no position blinks and data correction is not possible. For correction of data, press the AUSWAHL button ⑰ and move the cursor to a position which requires correction.

Timer recording operation

- When the preset start time is reached, recording starts.
- After timer recording, the power is switched off. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off.

VPS RECORDING

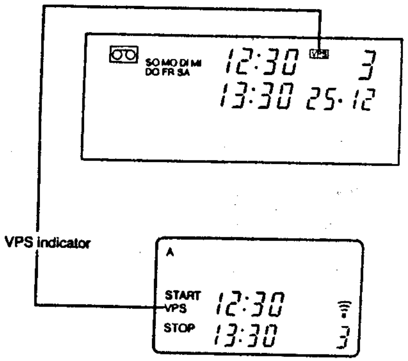
In the VPS (Video Programme System) system, TV stations transmit different VPS codes for different TV programmes, which control the starting and stopping of the video recorder and have precedence over times preset in the timer for accurate recording of a particular programme from start to finish.

1 Press the AUFZ. NR. button ● (or the VIDEO AUFZ. NR. button ⑧) or, for the remote control's memory, the SPEICHER AUFZ. NR. button ⑥.

2 Set the date, start time, stop time and channel in the same way as for timer programming.

3 Press the VPS/KANAL-EINSTELLUNG button ● or ⑭.
- All timer data will be converted to VPS codes and stored in memory.

4 Press the SCHALTUHR button ● or ③.
- The recorder will enter the VPS Standby mode at 20:00 on the day previous to the preset day and remain engaged until 3:59 on the following day, if the intended programme has not yet been broadcast.
- When a VPS code corresponding to the intended TV programme is detected during the VPS Standby mode, recording will start. When the VPS code changes to another, recording will stop.
- When an interruption code is detected during VPS recording, the VPS standby mode is engaged and recording restarts when the regular VPS code is restored.



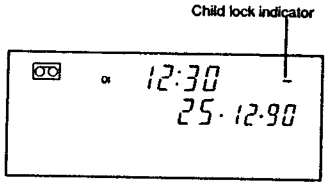
Note:
- Operation at the end of VPS recording is the same as with ordinary timer recording.

CHILD LOCK FUNCTION

The Child Lock function is for preventing accidental operation by young children, or other unwanted operation, such as playing back or recording over an important cassette you may have left inserted in the recorder. By engaging the Child Lock mode, the operation buttons on the recorder become ineffective, unless the remote control is used.

To engage the Child Lock mode

- Press the remote control's BETRIEB (VIDEO) button ㉜ to turn the recorder power off and keep this button pressed for about 2 seconds after the power LED indicator has gone off.
- The Child Lock indicator (-) will appear in the channel display section on the FDP to show that the recorder is now in the Child Lock mode.



To disengage the Child Lock mode

- When the remote control's BETRIEB (VIDEO) button is pressed to turn the recorder power on, this disengages the Child Lock mode. The recorder will turn on and the corresponding display will appear with the channel number appearing where the child lock indicator appeared before.
- Pressing the SCHALTUHR button during timer recording also disengages the Child Lock mode.

Notes:
- While in the Child Lock mode, the recorder can receive timer programmed data from the remote control.
- Timer recording is possible also, even while in the Child Lock mode. After timer recording has been performed, the Child Lock mode remains in effect.
- Even after automatic cassette ejection at tape end, following timer recording, the Child Lock mode remains in effect.
- It is possible to insert a cassette while in the Child Lock mode. After inserting a cassette, the Child Lock mode remains in effect.

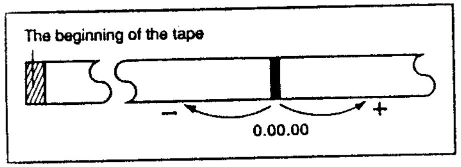
CONVENIENT TAPE ACCESS FUNCTIONS

REALTIME TAPE COUNTER

Unlike usual tape counters which show tape locations in numbers, this realtime tape counter shows tape time precisely in hours, minutes and seconds in all modes. The counter resets automatically when a cassette is inserted.

REALTIME SEARCH

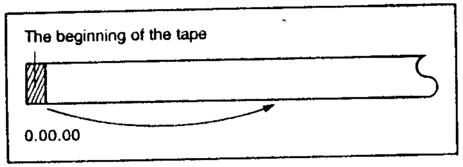
To locate any point on the tape a specified time away from the current position in either direction.



1. Press the remote control's ZIELLAUF button while in the Play, Still or Stop mode.
   - The FDP will show "ZIEL –St —M —S" if the recorder did not detect the leader tape when the cassette was loaded; it will show the current tape counter reading if the leader tape has been detected.
   - "ZIEL 0St 02M 34S" (for example) will appear if the recorder has already detected the leader tape, to show the current tape counter reading in terms of realtime from the tape's beginning.
2. Press either CURSOR (|←/→|) button or either KANAL (∨/∧) button to specify the direction.
3. Specify the time to the point to be located, by using the numeric keys.
   - Always key in a full number.
4. Press the ► or ■ button (❚❚ button, if either the Play or Still mode is already engaged).
   - Depending on the situation, search will take place in either the Shuttle Search mode or in the Fast Forward or Rewind mode. After the specified point is reached, playback starts automatically, the tape stops automatically or enters the Still mode, depending on the command.

REALTIME GO-TO

To locate any point on the tape a specified time away from the beginning of the tape.



The procedure is the same as for the Realtime Search except step 2. Specifying the direction is not necessary.

Notes:
- Each step in the operation procedure must be followed by the next within 60 seconds, otherwise the Go-To or Search mode will be cancelled.
- Use of the other control buttons while in the Go-To or Search mode cancels that mode.
- If the specified time exceeds the tape length, the tape fast forwards to the end and then rewinds to the beginning and stops or enters the Play mode.

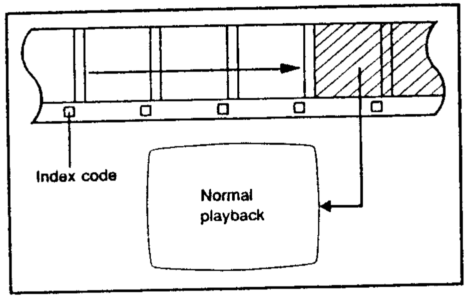
COUNTER MEMORY FUNCTION

1. Press the ZÄHLWERK-RÜCKST. button at a point which you may wish to locate later.
   - The counter will read "0St 00M 00S".
2. Press the ZÄHLWERK-SPEICHER button. [S] will appear on the FDP.
3. Press the ◄◄ (or ►►) button when you need to return to the designated point.
   - The tape will rewind (or fast forward) and stop at about "0St 00M 00S" automatically.
   - The Counter Memory function can also be used in conjunction with the Memory Play function (page 55).

CONTINUED ON NEXT PAGE . . .

INDEX SEARCH

The Index Search function gives you automatic access to the beginning of individual recordings on the cassette tape. An index code is automatically placed on the tape's control track each time a recording is begun. You can access any one of up to 99 of these indexed segments in either the forward or reverse direction.



1. Press the INDEX button while in the Play or Stop mode.
   - The channel display of the FDP will change to the Index Search mode and "INDX" will light.
2. Specify the index number (1 — 99) using the numeric keys within 10 seconds.
   - The specified number will appear on the FDP.
3. Press either the ◄◄ or ►► button.
   - The tape will move and the index numbers count down to 0, where normal playback will start.
   - If the INDEX button was pressed in the Play mode, the screen shows search pictures; if the button was pressed in the Stop mode, the index codes are detected in the Rewind or Fast-Forward mode.

Notes:
- To cancel the Index Search mode before completion, press the ► or ■ button.
- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

MANUAL INDEX MARK/ERASE

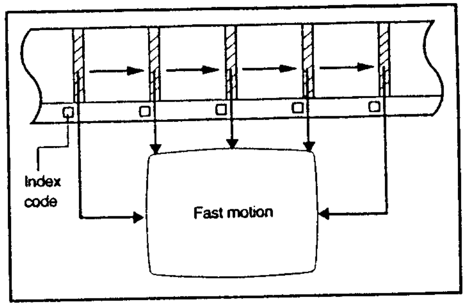
Index codes are automatically placed at the beginning of recordings which are started from the Stop or Timer Standby mode. You can use the MARKE button to add extra codes, and the LÖSCHEN button to erase codes. In neither case is there any effect on the audio or video recordings on the tape.

Erase
In the Play or Still mode, press LÖSCHEN button to erase the next index code. The tape is automatically fast-forwarded and when an index code is detected, it will be erased automatically. "INDX" on the FDP remains lit during the searching process and blinks during the erasing process.

Mark
In the Play or Record mode, press MARKE button once to put an index code onto the tape. "INDX" appears on the FDP and blinks during the marking process.

Notes:
- Index codes cannot be added or erased on a tape with its safety tab removed.
- The Erase mode is cancelled either after one index code has been erased or the Play mode is cancelled.

INTRO SEARCH

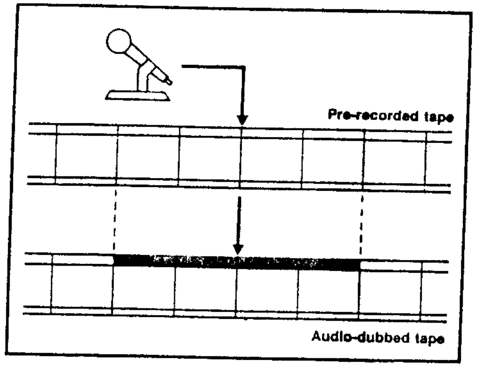


The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a programme each time an index code is detected.

1. Press the TITELBILD button while in the Play or Stop mode.
   - The INDX indicator on the FDP will light.
2. Press the ◄◄ or ►► button within 2 seconds.
   - The Intro Search will start in the corresponding direction.
   - Each time an index code is detected, the corresponding part is played back at the search speed (9 times normal) for about 5 seconds.
3. When you find the section you want to view, simply press the ► button.
   - Normal playback will start.

AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape. In other words, the previously recorded sound is erased and replaced with a new soundtrack.
Audio dubbing is applicable only to the longitudinal audio track (normal audio). Therefore, a dubbed narration can be heard together with the original hi-fi sound.



Operation

1. Switch on the TV receiver.
   - Adjust it to your video channel or to the AV mode (depending on the connection).
2. Load a pre-recorded cassette. Power will be switched on automatically.
3. Connect a microphone to the MIKROFON-EING. jack ⑮.
4. Press either KANAL button ⑬ to obtain "AU" on the FDP.
5. Be sure that the MIKROFON MIX control ⑰ is set to the appropriate level when required. Connect a pair of headphones to monitor this sound level adjustment.
6. Press WIEDERG. button ⑫ to start playback and then press RÜCKLAUF button ⑩ or VORLAUF button ⑪ to search for the point from which you wish to start audio dubbing.
7. Press PAUSE/STANDB. button ⑨ at the start point of audio dubbing.
8. Press VERTONUNG button ⑯.
9. Press WIEDERG.
   - Audio dubbing will start.

Notes:

- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the microphone farther away from the TV. Recording is being performed even if sound is not heard from the TV receiver. If you want to monitor the sound being recorded, connect headphones to the KOPFHÖRER jack.
- Marking index codes is not possible while audio dubbing is being performed.

CAUTION:

- Audio dubbing is not possible with an audio source connected to the rear panel AUDIO EING. connectors.

RECORDING FROM AN EXTERNAL SOURCE

By connecting an external video source (such as a 2nd video recorder, VideoMovie camera-recorder, etc.) to the AUDIO/VIDEO socket, tape-to-tape transfer is possible.

- For connection of these units an appropriate cable is necessary.

Connection

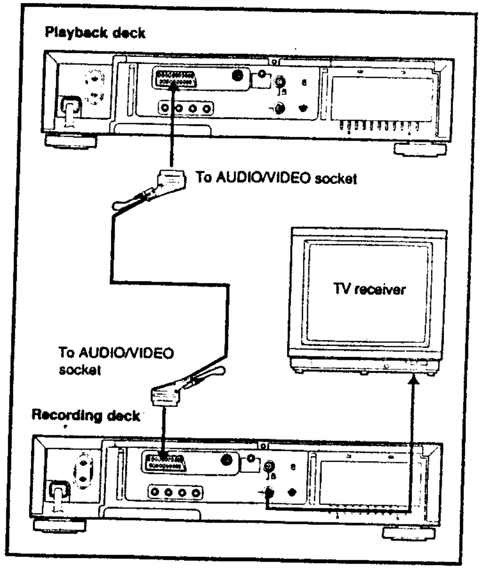
1. Connect the AUDIO/VIDEO socket to the appropriate audio/video output of the 2nd video recorder.
2. Connect a TV receiver to the recorder to monitor the picture while recording.

Operation

1. Turn the power on for all connected equipment.
2. Tune the TV receiver to your video channel.
3. Load a cassette with its safety tab in place.
4. Press either KANAL button ⑬ or the numeric key 0/AV ⑩ to obtain "AU" in the channel display section on the FDP.
5. Normally leave the SP/Hi-Fi LP button set to the SP mode ("SP" lights on the FDP).
   - In the Hi-Fi LP mode only sound can be recorded — up to 8 hours with an E-240 cassette. (Pictures cannot be recorded in the Hi-Fi LP mode.)
6. Press the AUFN./DA button ⑭ and the PAUSE/STANDB. button ⑨ to put the recorder in the Record-Pause mode.
7. Play back a tape on the source equipment to determine the segment to be recorded.
8. Press the WIEDERG. button ⑫ to start recording.
9. To stop recording temporarily, press the PAUSE/STANDB. button.
10. To end recording, press the STOP/CASSETTE button ⑥.

Note:

- For the operation of the source equipment, refer to the instruction manual of the relevant machine.

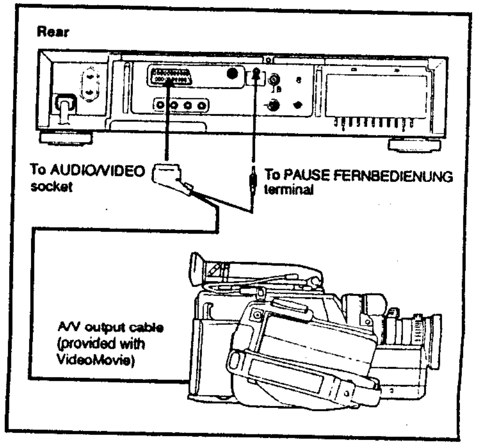


EDITING TO ANOTHER VIDEO RECORDER

This video recorder can also be used as the source player when editing tapes. This video recorder's PAUSE FERNBEDIENUNG terminal is designed to accept a preroll command when used as a source player with a video deck which is preroll-capable and equipped with a Pause Control Output terminal. This combination makes possible synchronized preroll editing for high-quality editing results.

EDITING FROM A VIDEOMOVIE

- Connect the VideoMovie's AV OUT connector to the video recorder's AUDIO/VIDEO socket.
- Connect the mini-plug of the AV output cable to the remote PAUSE terminal of the video recorder.
- When the recorder is connected to a VideoMovie which incorporates a Master Edit Control system, you can control the recorder with the VideoMovie's controls for making edits free of transition-point gaps and distortion. Refer to the VideoMovie's instruction manual for detailed operating procedures for editing.
- With this connection, you can also use the VideoMovie as a video camera for direct recording onto the recorder's tape. Put the recorder in the Record-Pause mode and operate the VideoMovie's start/stop trigger to start and pause recording. (For direct recording with a separate video camera, a camera adapter is necessary.)


Rear
To AUDIO/VIDEO socket
To PAUSE FERNBEDIENUNG terminal
A/V output cable (provided with VideoMovie)

DUET EDITING

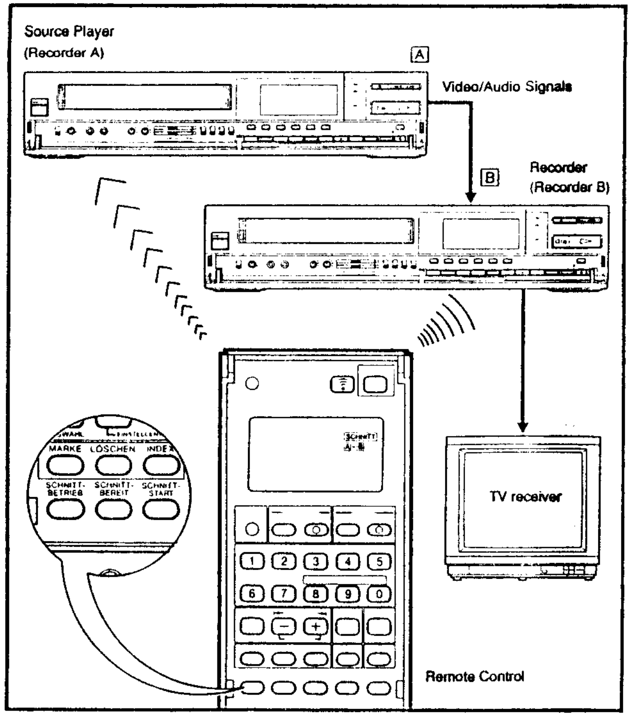
Designed specifically to simplify editing operations, the Duet Editing function delivers separate commands to two recorders simultaneously via a single remote control, taking advantage of the A/B code system. (JVC dedicated models only)

Preparations

- Connect two recorders as described in "RECORDING FROM AN EXTERNAL SOURCE" on the previous page.
- Set one recorder to respond to A code signals, the other, to respond to B code signals. (See page 43.)
- Place the two recorders side by side.

Notes:

- JVC video recorders with infrared remote control units which are not equipped with an A/B code select switch are designed to receive A code signals. Therefore, Duet Editing is possible with JVC decks if the HR-D860EG is set to respond to B code signals.
- It is not possible to perform Duet Editing unless the remote control's clock has been previously set.



OPERATION

Remote Control	Recorder A (Source player)	Recorder B (Recorder)
	Load a recorded tape.	Load a blank tape.
1. Press SCHNITT-BETRIEB "SCHNITT [A] → [B]" appears on LCD.		
2. Press SCHNITT-BEREIT.	Enters STILL mode.	Enters RECORD-PAUSE mode.
3. Search for an edit-in point on the source tape. Press ❚❚.	Functions as commanded. (In this state, only recorder A responds to the remote control's commands.)	Remains in RECORD-PAUSE mode.
4. Press SCHNITT-START.	Enters PLAY mode.	Enters RECORD mode.
5. Press ❚❚.	Enters STILL mode.	Enters RECORD-PAUSE mode.
6. Repeat steps 3, 4 and 5 to continue editing.		

Notes:

- You can use Recorder B (the recorder set to respond to B code signals) as a source player and Recorder A as a recorder. In this case, press the A/B-CODE button after step 1 to obtain "SCHNITT [B] → [A]" indication.
- To cancel the Duet Edit mode and return to normal remote control functions, press the SCHNITT-BETRIEB button so that the SCHNITT indication disappears.
- When the START button is pressed, the recorder takes a few seconds before actual editing starts due to the automatic *backspace editing system. At the same time the START button is pressed, the player starts playback from the specified edit-in* point. Therefore, it is recommended that you specify a point slightly before the intended edit-in point in step 3 for more accurate editing. This also ensures that the picture of the resulting edit will be more stable.

IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first ...

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	● Is the power cord disconnected? — Connect it.
Clock is functioning properly, but the recorder cannot be powered.	● Is the TIMER indicator lit on the FDP? — Press SCHALTUHR to disengage the Timer Recording Standby mode.
Tape does not run during recording.	● Is the PAUSE/STANDB. button engaged? — Press the WIEDERG. button.
Tape stops in the Rewind or Fast-Forward mode.	● Is the ZÄHLWERK-SPEICHER switch set so that "S" appears on the FDP? — Press to make "S" disappear.
Tape will not rewind or fast forward.	● Is the tape already fully rewound or fast forwarded? — Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	● Is a cassette loaded? ● Is the safety tab on the cassette removed? — Reseal the slot with cellophane tape.
Camera recording is not possible.	● Are the camera and the camera adapter correctly connected? ● Is the power switch of the camera adapter set to ON? ● Does the channel display indicate "AU"? — Press "0/AV".
Simulcast recording is not possible.	● Has the SIMUL button been pressed? — Press it so "SIM" appears on the FDP. ● Is an audio source correctly connected to the AUDIO EING. connectors? — Check connections.
Timer recording is not possible.	● Have you set the clock correctly and programmed the timer correctly? — Check once again. ● Is the TIMER indicator lit on the FDP? — Press the SCHALTUHR button.

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running	● Is the TV receiver's channel selector set to the correct video channel? — Set it to the RF converter channel. (See page 45.) ● If you are using AV connection, is the television engaged in the AV mode? — Operate the television's mode.
Playback is repeated.	● Is the WIEDERHOLUNG switch set to either "KOMPL." or "INDEX"? — Set it to "AUS".
Noise appears during playback.	● Is the automatic tracking mode engaged? — Engage the manual tracking mode. (See page 54.)
Playback picture is blurred or interrupted while TV broadcasts are clear.	● Video heads may be dirty. — Head cleaning is necessary. Consult your JVC dealer.

HI-FI AUDIO PROBLEMS

Symptoms	Check points
TV sound cannot be recorded on hi-fi audio track.	• Has the SIMUL button been pressed? — Press it again so "SIM" no longer appears on the FDP.
Soundtrack on the hi-fi audio track cannot be reproduced.	• Is the NORM indicator lit? — Press the Hi-Fi/NORM/MIX button for Hi-Fi L and R to light as required.

OTHERS

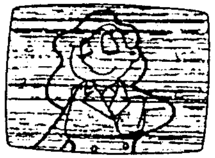
Symptoms	Check points
Whistling or howling is heard from TV.	• Move camera or microphone away from TV or reduce TV sound volume.
Some channels are skipped over when selecting a channel.	• Those channels are preset to be skipped over. If you need them, restore them. (See page 52.)
Channel cannot be switched.	• Is recording in progress? — Press PAUSE/STANDB., select a desired channel and press WIEDERG.
The recorder cannot be operated with the remote control.	• Batteries are discharged. — Replace with new one. • Is the A/B-CODE indicator showing the proper code for the recorder being operated? — Press the A/B-CODE button to switch the remote control to the correct setting.
Index Search does not function properly.	• Adjacent index codes may be too close to each other. — Erase some index codes and mark new ones, if necessary, with sufficient distance between two index codes.

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the video heads after long periods of use causes such problems. In this case, head cleaning requiring highly technical care is necessary.

For head cleaning, consult the nearest JVC dealer.

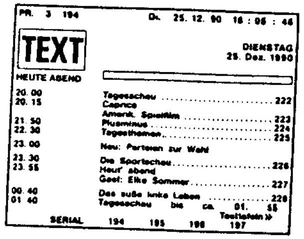


TELETEXT COMPATIBILITY

Teletext services are becoming popular and a vast number of teletext pages are now available for a variety of information. This recorder is ready to take advantage of these services, not only for simple viewing but also for programming the recorder's built-in timer in an extremely easy way. All you need to do is connect the optional VPT or VPV adapter to the rear of the recorder. Then the recorder's remote control exhibits its full capability with all the dual or triple-function control keys working as intended. The following information shows examples of using the optional VPT adapter.

TELETEXT

- View broadcast teletext pages.
- Several page access modes are available for quick and convenient viewing.
- Programme the timer using TV schedule pages.



PR. 3 194 Di. 25. 12. 90 18 : 06 : 44

TEXT

DIENSTAG
25. Dez. 1990

HEUTE ABEND

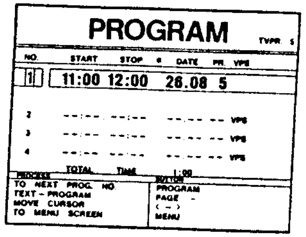
20. 00	Tagesschau	222
20. 15	Caprice Amerik. Spielfilm	223
21. 50	Plusminus	224
22. 30	Tagesthemen	225
23. 00	Neu: Parteien zur Wahl	
23. 30	Die Sportschau	226
23. 55	Heut' abend Gast: Elke Sommer	227
00. 40	Das süße linke Leben	228
01 40	Tagesschau bis ca. 01. 55	

Testtafeln »

SERIAL 194 195 196 197

PROGRAM

- Check the timer recording data on the colour display.
- Programme the timer manually with 10-key input.

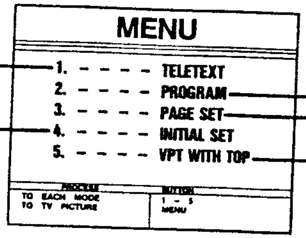


PROGRAM TVPR. 5

NO.	START	STOP		DATE	PR.	VPS
1	11:00	12:00		26.08	5	
2	--:--	--:--		--.--	--	VPS
3	--:--	--:--		--.--	--	VPS
4	--:--	--:--		--.--	--	VPS

TOTAL TIME 1:00

PROCESS	BUTTON
TO NEXT PROG. NO.	PROGRAM
TEXT – PROGRAM	PAGE –
MOVE CURSOR	(→)
TO MENU SCREEN	MENU



MENU

1. – – – – TELETEXT
2. – – – – PROGRAM
3. – – – – PAGE SET
4. – – – – INITIAL SET
5. – – – – VPT WITH TOP

PROCESS	BUTTON
TO EACH MODE	1 – 5
TO TV PICTURE	MENU

PAGE SET

- Preset teletext pages so that you can quickly access your favourite or frequently-referred-to pages.
- Four pages can be preset for each of the keys, 0 to 9, totalling 40 pages.

INITIAL SET

LANGUAGE

- Select one of four languages (English, German, Italian or Swedish) for on-screen messages.

CLOCK ADJUST

- Set the VCR's clock manually with 10-key input.
- Automatic clock setting by reading time information from teletext pages.

VPT WITH TOP

- TOP automatic teletext timer programming.
  - * "5. – – – – VPT WITH TOP" appears only when the VCR's tuner is tuned to a station which is transmitting TOP broadcasts.

SECTION 1
DISASSEMBLY AND MECHANISM ADJUSTMENTS

1.1 DISASSEMBLY

1.1.1 Top cover

1. Refer to Fig. 1-1-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 4 screws Ⓐ and 1 screw Ⓑ. To remove the top cover, slide it in the direction of the arrow and lift it away.

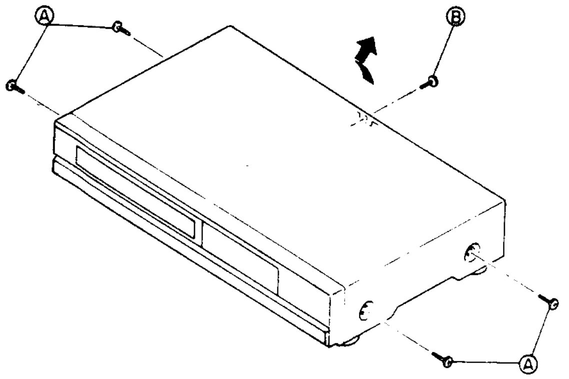


Fig. 1-1-1

1.1.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabs Ⓒ of the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-1-2 and pull the front panel assembly forward you to disengage 3 tabs Ⓓ of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

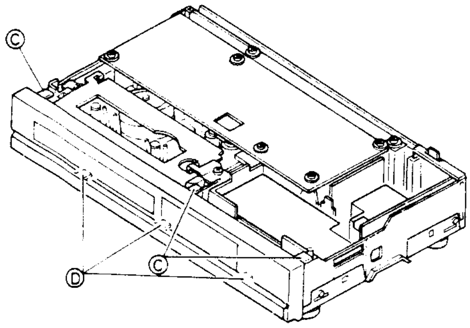


Fig. 1-1-2

1.1.3 Bottom cover

1. Remove the top cover.
2. Refer to Fig. 1-1-3 and take out 4 screws Ⓔ and 2 screws Ⓕ from the bottom of the chassis.
3. Disengage the bottom cover from 4 claws Ⓖ on the bottom of the chassis.

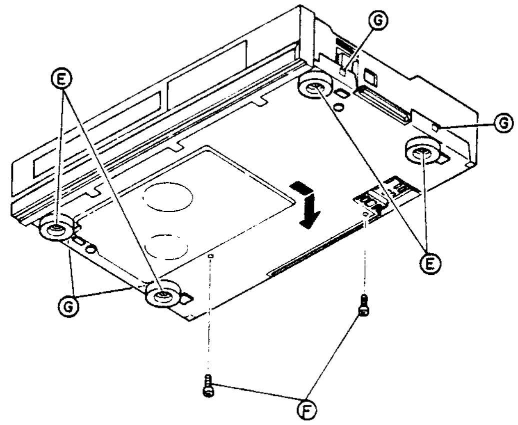


Fig. 1-1-3

1.1.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-4 and take out 5 screws Ⓗ and 1 screw Ⓘ from main board assembly.

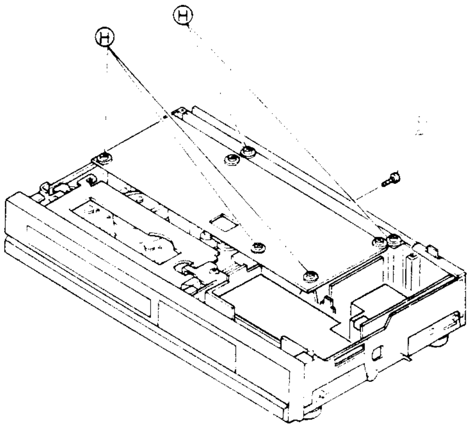


Fig. 1-1-4

1.1.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-1-5 and 1-1-6.
   Take out 4 screws Ⓙ that secure the cassette housing. Disengage 3 tabs Ⓚ of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
   Remove the cassette housing in the upward direction.

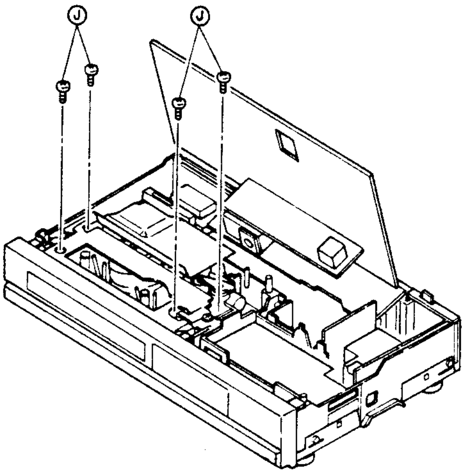


Fig. 1-1-5

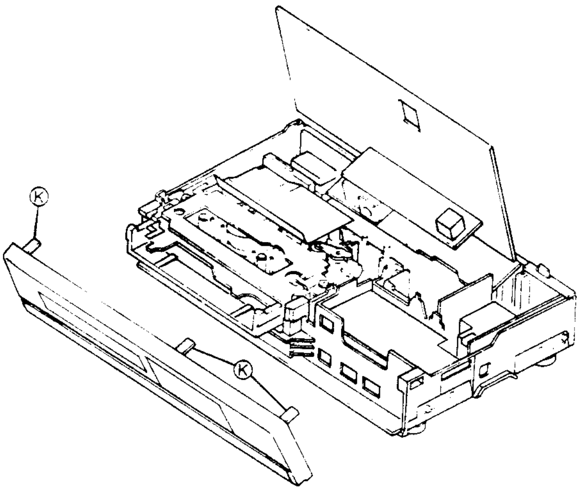


Fig. 1-1-6

1.1.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-1-7.
   If necessary, turn the loading motor by hand to obtain these positions.

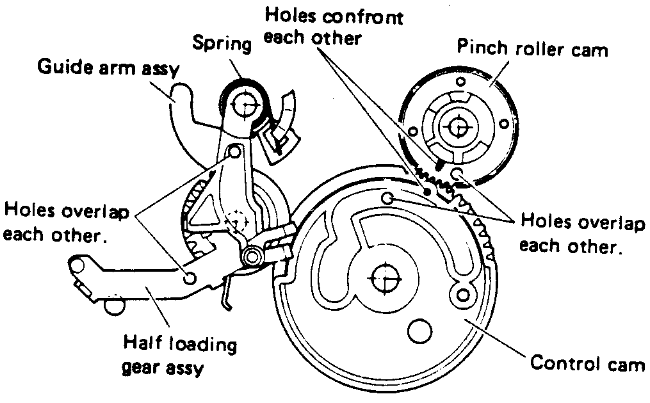

Holes confront each other
Spring
Guide arm assy
Pinch roller cam
Holes overlap each other.
Holes overlap each other.
Half loading gear assy
Control cam

Fig. 1-1-7

2. Refer to Fig. 1-1-8 and confirm that the clutch is engaged.
   If necessary, press the lever indicated by the arrow to where the clutch is locked.

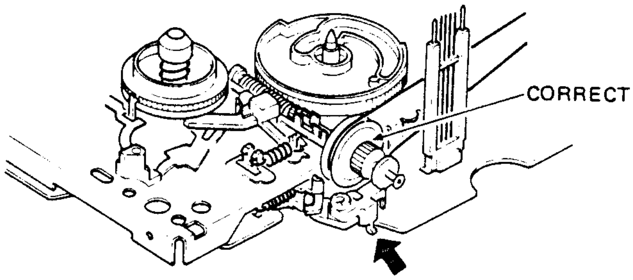


Fig. 1-1-8

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
   Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-1-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

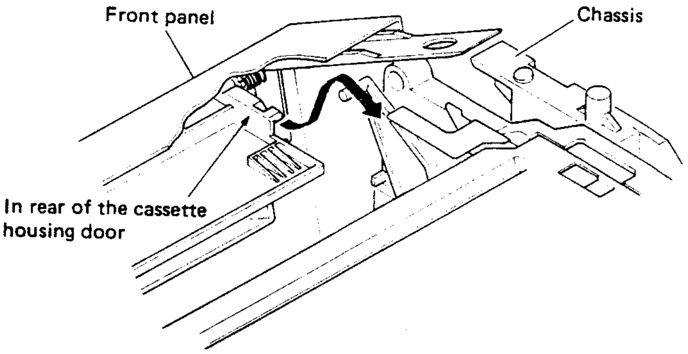

Front panel
Chassis
In rear of the cassette housing door

Fig. 1-1-9

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

1.1.7 Cassette housing door

1. Remove the top cover and front panel assembly.
2. Take out one screw Ⓛ of the front panel assembly.
3. Refer to Fig. 1-1-10 and use care regarding the torsion spring, then pull out the left end of the cassette housing door to move it.

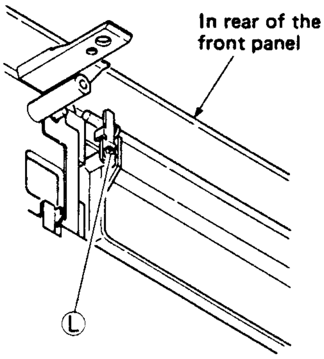


Fig. 1-1-10

1.1.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-1-11 and take out 3 screws Ⓜ from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect a connector of CN601 from the Main board, connectors of CN1, CN2 from the Pre/Rec board, connectors of CN1, CN2 from the A/C head board, a connector of CN1 from the Loading MDA board and a connector of CN1 from the Drum MDA board.

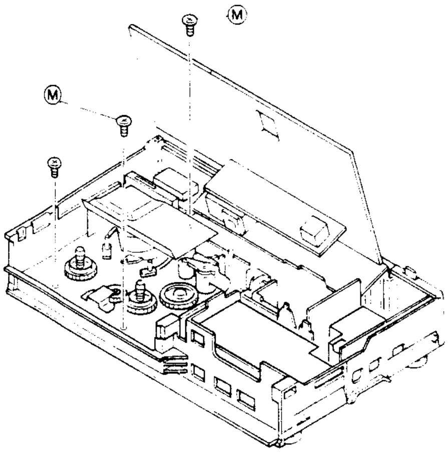


Fig. 1-1-11

1.2 MECHANISM ADJUSTMENTS

1.2.1 Precautions

1. Disconnect VCR from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this is omitted, the door will not open at Eject and the cassette cannot be removed.

1.2.2 Check without cassette housing

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of Main board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

1.2.3 Manually removing cassette tape

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-3-1, 1-3-2 and 1-3-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

1.2.4 Test equipment

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tapes : MH-2
   Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
   Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
   Measures tape tension at the supply side.
4. A/C head positioning tool : PUJ47351-2
   Shifts the head base for adjusting the control head position.
5. Roller driver : PTU94002
   Turns the guide roller for adjusting FM linearity.

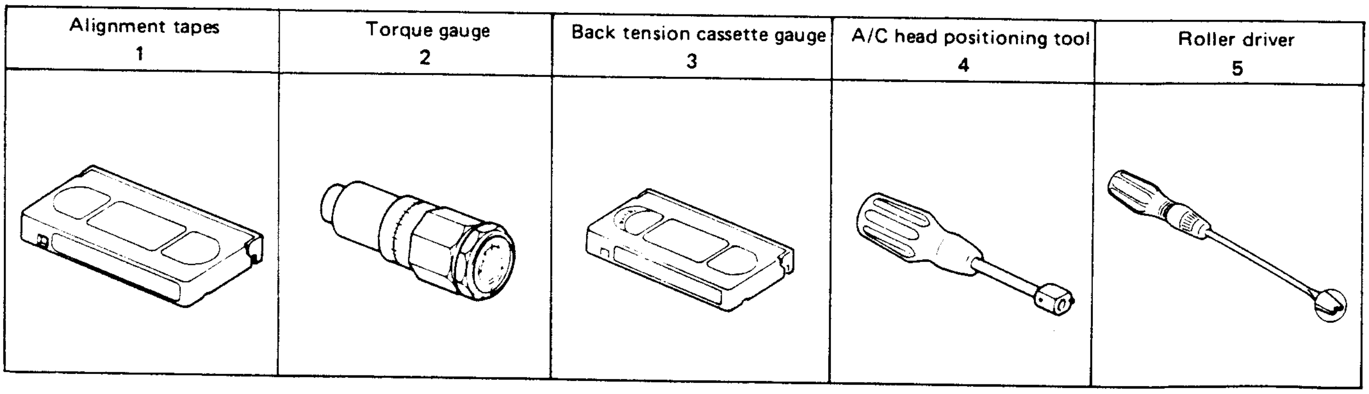


Fig. 1-2-1 Test equipment

1.3 MAIN MECHANISM PARTS

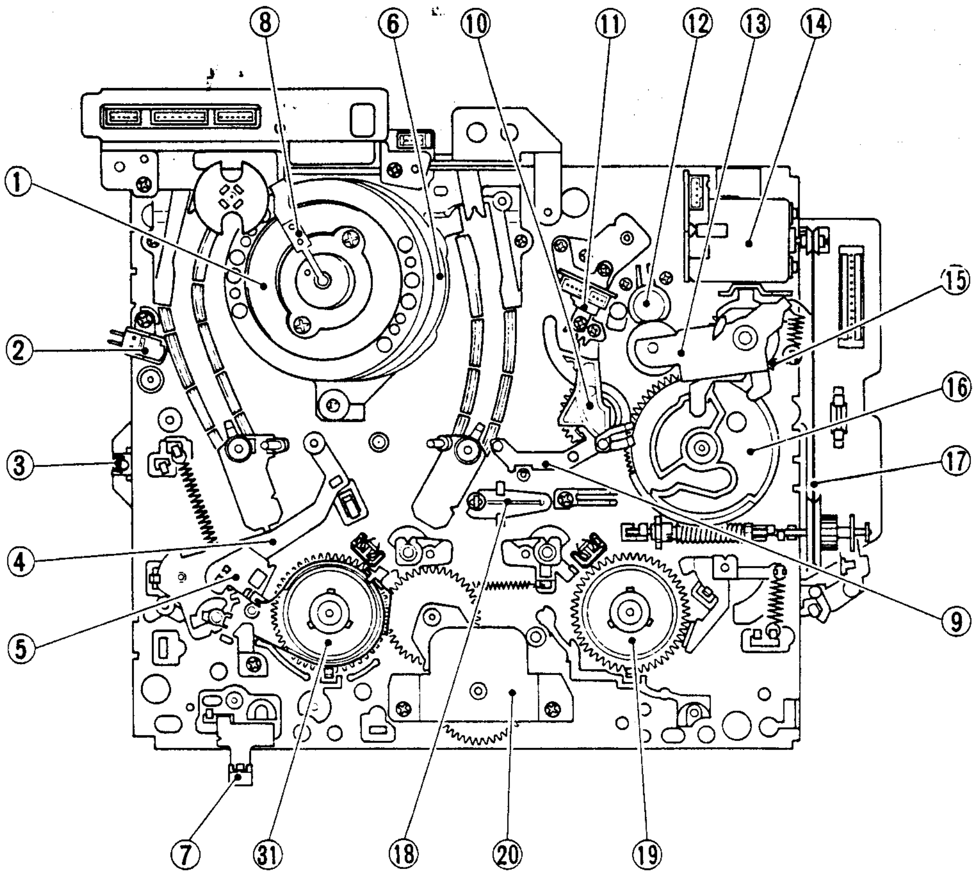

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Fig. 1-3-1 Top view of main-deck

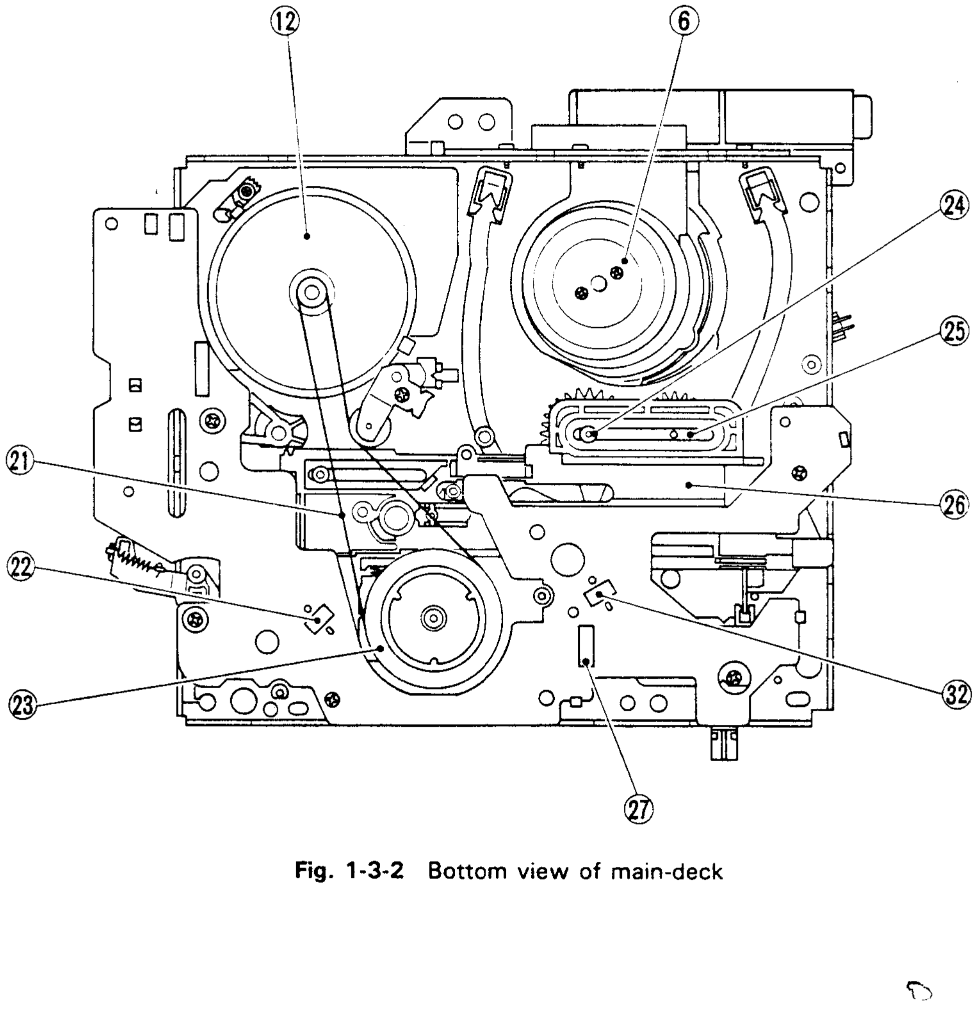
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Fig. 1-3-2 Bottom view of main-deck

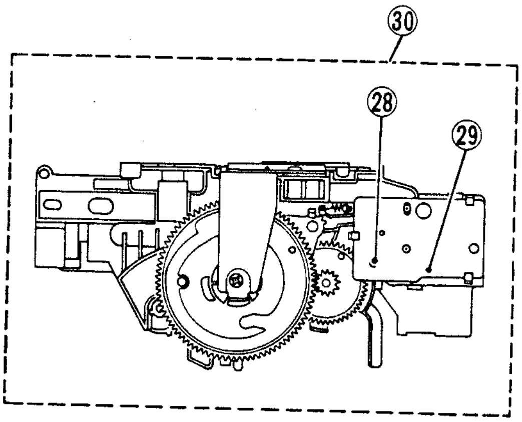


Fig. 1-3-3 Side view of cassette housing

A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

B. Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.

Before oiling, clean with alcohol.
Apply one or two drops of oil. Avoid excess oil.

1. Table 1-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KANTO-G-31KAV

Table 1-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

Note: *Stir grease that has been stored for an extended period.*

C. Main mechanical parts

See Figs. 1-3-1, 1-3-2 and 1-3-3.

No.	Symbol	Parts Name	See Section
1	M32A	Upper drum assy	
2	M44	Full erase head	
3	51Q1	End sensor	
4	M41	Tension arm assy	1.5.4
5	M42	Tension band assy	1.5.4
6	M32C	Lower drum motor assy	1.5.2
7	M461	REC safety switch (S2)	
8	M32D	Brush assy	
9	M449	Half loading gear assy	1.5.5
10	M447	Guide arm assy	1.5.5
11	M48	A/C head	1.5.3
12	M422	Capstan motor	
13	M442	Pinch roller arm assy	
14	M434	Loading motor assy	
15	M446	Pinch roller cam	1.5.5
16	M438	Control cam	1.5.5
17	M437	Loading belt	
18	M460	LED holder (D1)	
19	M430	Reel disk (take-up)	
20	M424	Idler gear unit	
21	M429	Timing belt	
22	51PHS1	Take up reel sensor (PS1)	
23	M426	Clutch unit	1.5.6
24	M433	Take up loading arm assy	1.5.7
25	M432	Supply loading arm assy	1.5.7
26	M439	Plate assy	1.5.7
27	M462	Slide switch (S3)	
28	56PHS3	Cassette sensor (PHS3)	
29	56Q2	Start sensor (Q2)	
30	M36	Cassette housing assy	
31	M470	Reel disk (supply)	
32	51PHS2	Supply reel sensor (PS2)	

- Symbol interpretation example

M32A
└ Ref. No.
└ Exploded view symbol

56 Q2
└ Ref. No.
└ Board No.

1.4 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced at when required.

1.4.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

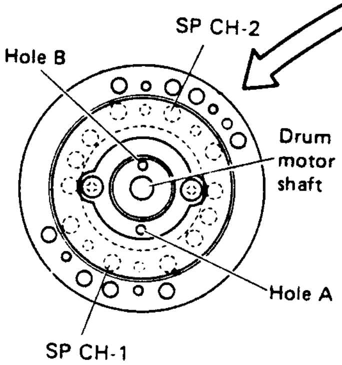
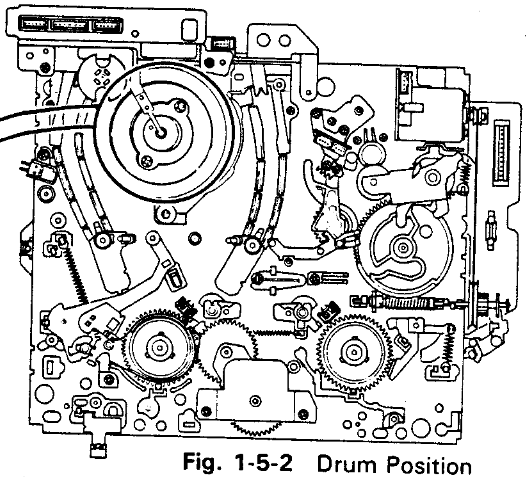
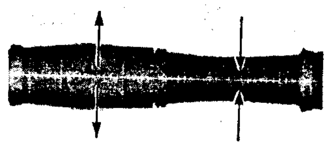
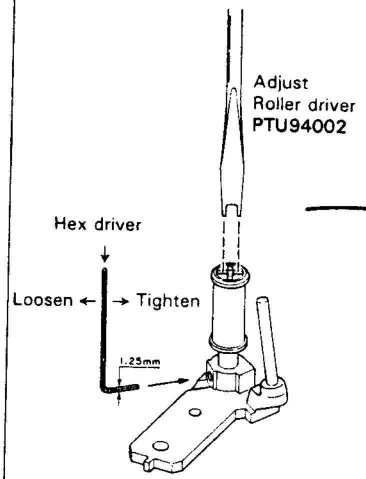
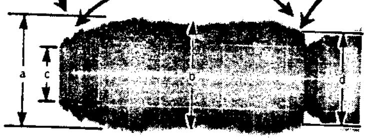
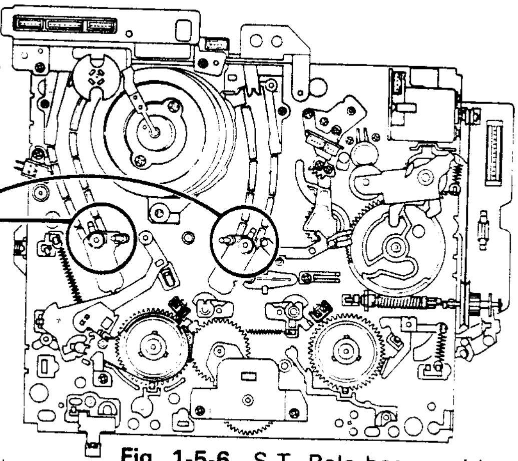
System	No.	Parts Name	Symbol No.	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	Overhaul
Tape Transport	1	Upper drum	M32A	★	★	☆	○	○	○	○	○	●
	11	A/C head	M48	★	★	★	○	○	○	○	○	●
	13	Pinch roller	M442	★	★	★	○	○	○	○	○	●
	2	Full erase head	M44	★	★	★	○	○	○	○	○	●
	4	Tension arm	M41									●
	6	Lower drum	M32C				○	○	○	○	○	●
	12	Capstan (shaft)	M422	★	★	★	★	★	★	★	★	●
	9	Half loading gear	M449									●
	10	Guide arm	M447									●
Drive	12	Capstan motor	M422				○	○	○	○	○	●
	17	Loading Belt	M437				○	○	○	○	○	●
	21	Reel Belt	M424				○	○	○	○	○	●
	19	Take-up reel disk	M430				○	○	○	○	○	●
	31	Supply reel disk	M470				○	○	○	○	○	●
	23	Clutch assy	M426								○	●
	14	Loading motor	M434				○	○	○	○	○	●
		Worm clutch assy	M436								△	●
	26	Plate assy	M439								△	●
Others	5	Tension band	M42				○				○	●
	8	Brush	M32D				○				○	●

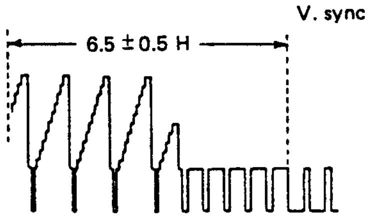
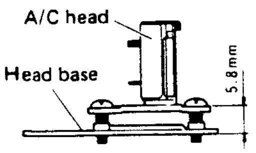
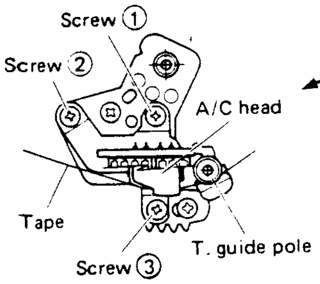
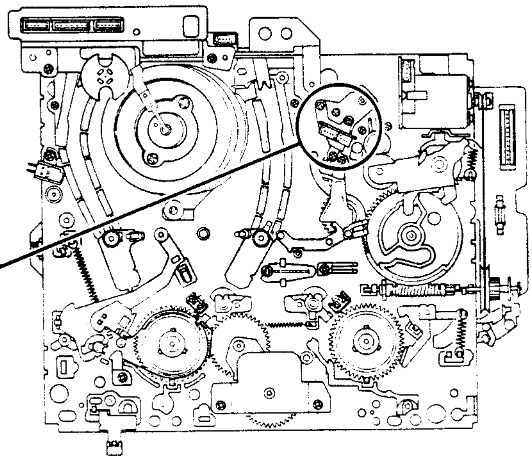
★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
No: Refer to Main mechanical parts

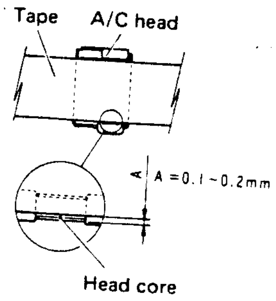
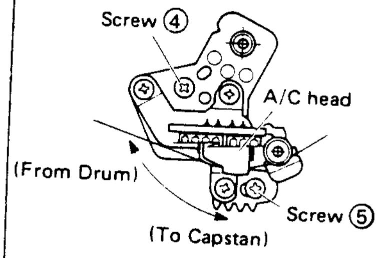
▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

Table 1-4-1 Approximate maintenance schedule

1.5 MAIN PARTS REMOVAL AND REPLACEMENT

No.	Item	Checkpoints	Adjustment and Checks
1	Upper drum assembly •Symptoms: FM signal absent, intermittent or weak on one channel; large difference in channel output levels •Cause: Worn or damaged video heads, poor response, etc.  **Fig. 1-5-1** DRUM TOP VIEW	Mounting direction See Fig. 1-5-1. (Symptom: no picture)	 **Fig. 1-5-2** Drum Position After replacing, observe that upper drum hole A is opposite the motor axis from lower drum hole B.
		Axis wobble See Fig. 1-5-2. (Symptom: jitter, poor FM linearity) PB FM: Main board TP206 FF: Main board TP411	Record and playback in SP mode. Confirm absence of large difference between channels. (Fig. 1-5-3)  **Fig. 1-5-3** Axis wobble
		 Adjust Roller driver PTU94002 Hex driver Loosen Tighten 1.25mm **Fig. 1-5-4** S.T. Pole base	FM linearity check See Fig. 1-5-5. (Symptom: vertical sync absent, picture noise) PB FM: Main board TP206 FF: Main board TP411  **Fig. 1-5-5** FM linearity $\frac{b}{a} \geqq 0.7, \frac{c}{a} \geqq 0.65, \frac{d}{a} \geqq 0.65$	 **Fig. 1-5-6** S.T. Pole base position 1) Play stairstep signal of the MH-2 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point. 2) Refer to Fig. 1-5-4, adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base. **Note:** ***If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.***

No.	Item	Checkpoints	Adjustment and Checks
	PB switching point •Symptom: switching noise at picture bottom.	VIDEO OUT  **Fig. 1-5-7** PB Switching Point	1) Connect an oscilloscope to VIDEO OUT. 2) Set the MH-2 alignment tape into the cassette housing. Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411 (DRUM FF) of the main board. 4) Adjust R420 to position the trigger point 6.5 H ±0.5 H from V. sync as shown in Fig. 1-5-7.
2	Lower drum assembly •Symptoms: Poor FM linearity, noisy rotation, jitter •Cause: Lead and bearing wear	Check FM linearity and switching point.	See above upper drum assembly items.
		Check control head phase (X value) Symptom: tracking error PB FM: Main board TP206 FF: Main board TP411	1) Play stairstep signals of MH-2 Alignment Tape. Engage the Tracking Preset mode by pressing the + and – buttons simultaneously in the onscreen mode. Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually. 2) Refer to the A/C head adjustments.
3	A/C head  **Fig. 1-5-8** Temporary height  Screw ① Screw ② A/C head Tape T. guide pole Screw ③ **Fig. 1-5-9** Inclination/Azimuth/ Height adj.	 **Fig. 1-5-10** A/C HEAD position Temporarily set height as indicated in Fig. 1-5-8.	Set the height as indicated in Fig. 1-5-8 to facilitate tape transport checks and adjustments.
		Tilt (forward inclination) See Fig. 1-5-9. (Symptom: audio level varies greatly.)	1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller. 2) Then slowly turn the screw clockwise to where the curling ceases.
		Azimuth See Fig. 1-5-9. (Symptoms: audio low level or noisy) Audio output: Main board AUDIO OUT	1) Play stairstep signal (with audio 6 kHz) of the MH-2 Alignment Tape. Observe audio output signal with oscilloscope. 2) Turn screw ② and adjust for maximum audio output level.

No.	Item	Checkpoints	Adjustment and Checks
	 **Fig. 1-5-11** Height Adj	Height See Figs. 1-5-9 and 1-5-11. (Symptom: low audio and control signal levels)	1) Run tape and observe the control head area. 2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen. **Note:** *If difficult to observe, play stairstep signal of MH-2 Alignment Tape and adjust for maximum audio output and control pulse level.*
		FM linearity	Refer to upper drum assembly items. If adjustment is major, again check the azimuth.
		Control head phase See Fig. 1-5-12 PB FM: Main board TP206 FF: Main board TP411  Screw ④ A/C head (From Drum) Screw ⑤ (To Capstan) **Fig. 1-5-12** CTL head phase	1) Play stairstep signal of MH-2 Alignment Tape and observe the FM waveform. Set for Tracking Preset by pressing the + and − buttons simultaneously in the onscreen mode. 2) Loosen screws ④ and ⑤. Set the A/C head positioning tool on screw ④, with the stud inserted into the nearby oblong hole. 3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 1-5-13. 4) Tighten screw ⑤ . Remove the tool and tighten screw ④.

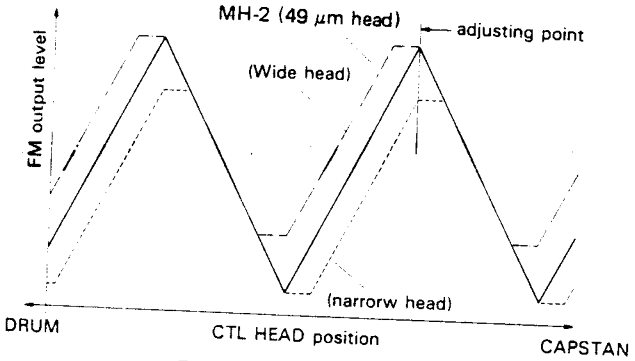
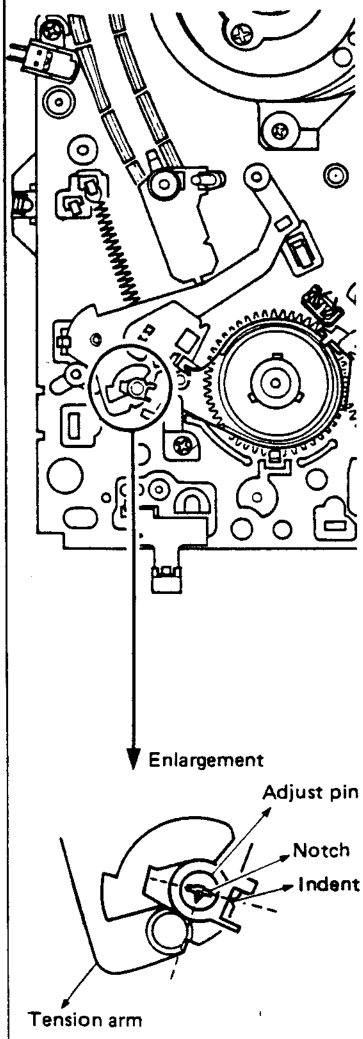
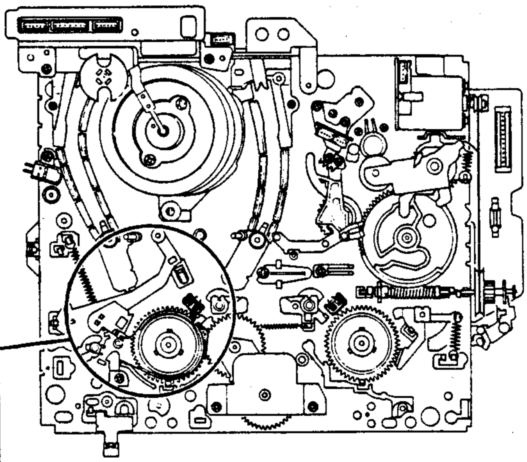
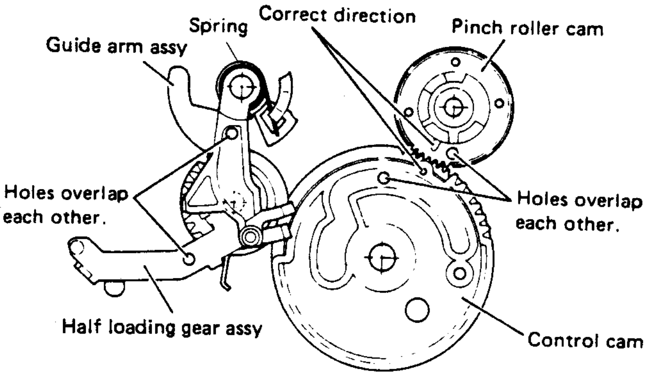
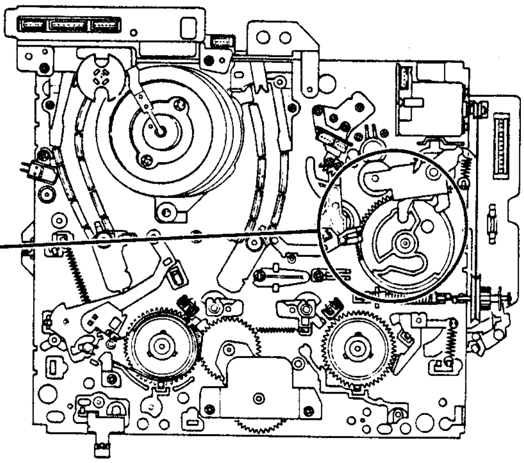
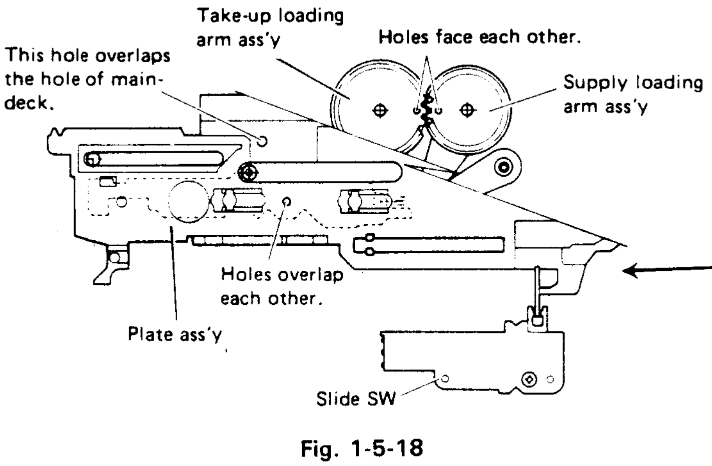
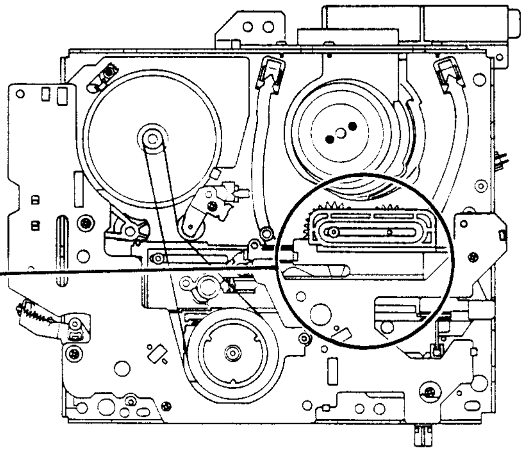


Fig. 1-5-13 CTL head phase

Note: *Trigger the oscilloscope externally signal from TP411 (DRUM FF). Use (+) trigger for MH-2 alignment tape.*

No.	Item	Checkpoints	Adjustment and Checks
4	Tension arm assembly Tension band assembly  **Fig. 1-5-14** Tension arm assy	Tension pole position See Fig. 1-5-14. (Symptom: poor FM waveform response)	 **Fig. 1-5-15** Tension arm position 1) Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position). 2) Turn the eccentric adjust pin to align the notch of the pin with the tension arm indent as shown in Fig. 1-5-14.
		Back tension (Symptom: skew)	1) When the tension pole position is correctly adjusted, the back tension will assume the correct value. 2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 35 to 48. 3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere.

No.	Item	Checkpoints	Adjustment and Checks
5	Pinch roller cam Control cam Half loading gear assembly Guide arm assembly  Correct direction Spring Guide arm assy Pinch roller cam Holes overlap each other. Holes overlap each other. Half loading gear assy Control cam Fig. 1-5-16 Control/Pinch roller cam	Important: Do not remove or disturb parts other than those mentioned. See Fig. 1-5-16.	Set mechanism to Eject mode (internal holder of the cassette housing is locked in raised) position.  Fig. 1-5-17 Control cam position 1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck. 2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned. (If the control cam does not fit readily, shift the rear plate assembly within the range of play.) 3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring. 4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly.
		Cassette housing assembly	Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked.
6	Clutch assembly	Take-up torque (Symptom: inadequate take-up torque)	1) Remove cassette housing and set for playback mode (see Section 1.2). 2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100.

No.	Item	Checkpoints	Adjustment and Checks
7	Take-up loading arm assembly Supply loading arm assembly Plate assembly		**Note:** • *Set mechanism to the Eject or Stop mode before removing these parts.* • *The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.*
		Mounting position alignment • Remove the tension arm assembly to facilitate operation. See Fig. 1-5-18.	1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets. 2) Shift the plate assembly and install with the holes of the upper and lower components overlapped.
		Slide switch See Fig. 1-5-18.  Take-up loading arm ass'y Holes face each other. This hole overlaps the hole of main-deck. Supply loading arm ass'y Holes overlap each other. Plate ass'y Slide SW Fig. 1-5-18	Be sure to engage the slide switch slider with the edge of the plate assembly.  Fig. 1-5-19 T.S. Loading arm position

SECTION 2
ELECTRICAL ADJUSTMENTS

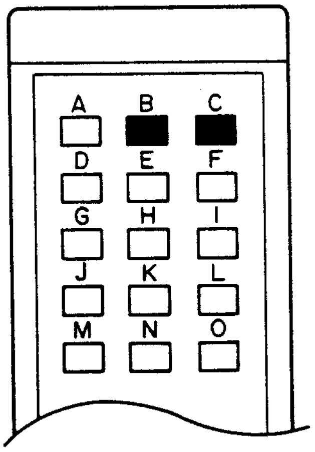
2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Colour television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL colour bar, stairstep, video sweeper
9. Signal generator: Audio multiplex TV signal generator
10. Recording tape
11. Alignment tape: MH-2
12. Presetting unit (PTU94008)

Presetting unit


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

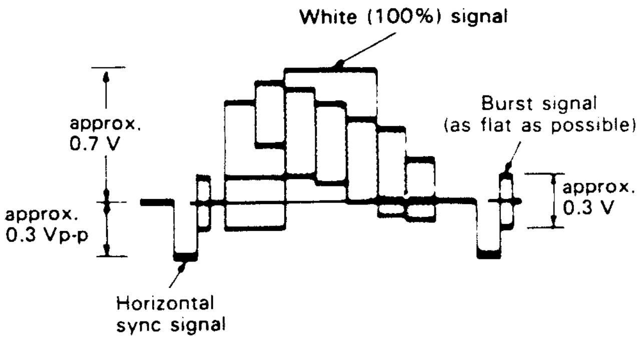

White (100%) signal
approx. 0.7 V
Burst signal (as flat as possible)
approx. 0.3 V
approx. 0.3 Vp-p
Horizontal sync signal

Fig. 2-1-1 Colour bar signal of pattern generator

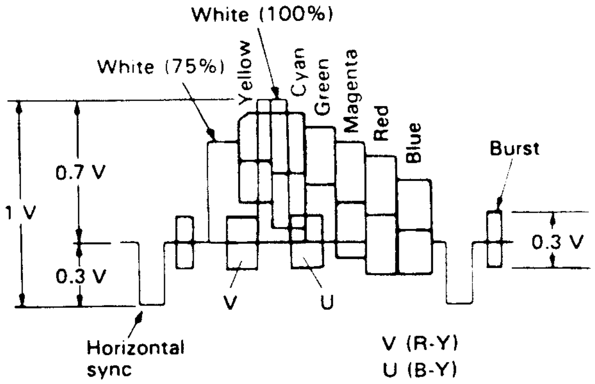

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1 V
0.3 V
0.3 V
V
U
Horizontal sync
V (R-Y)
U (B-Y)

Fig. 2-1-2 Colour bar signal waveform

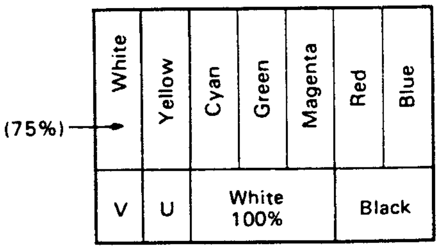

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
V
U
White 100%
Black

Fig. 2-1-3 Colour bar pattern

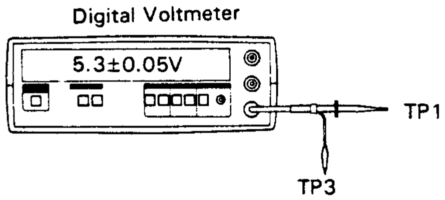
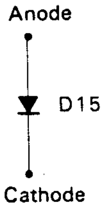
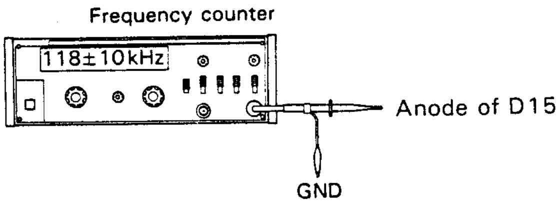
2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (–) indicates check only.
Signal & Mode	• Input signal required to perform adjustment. Dash (–) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.
Colour bars	Colour bars signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-2 colour bars	Colour bars segment of MH-2 alignment tape.
MH-2 stairstep	Stairstep segment of MH-2 alignment tape.
MH-2 1 kHz	1 kHz audio signal segment of MH-2 alignment tape.
MH-2 RF sweep	RF sweep segment of MH-2 alignment tape.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
SP mode	SP recording speed
Description	This column provides an explanation of the step, notes and adjustment values.

2.2 SWITCHING REGULATOR CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the SWITCHING REG board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	5V DC OUTPUT	TP1 (INPUT) TP3 (GND)	R37 (SWD 5 V ADJ)	• Tuner mode • REC • SP mode	1) Insert recording video cassette to the cassette housing and set for the REC mode. 2) Connect a digital voltmeter as shown in Fig. 2-2-1. 3) Adjust R37 for 5.3±0.05 V  **Fig. 2-2-1**
2	Confirmation of oscillation	Anode of D15 		• Tuner mode • REC • SP mode	1) Insert a recording video cassette into the cassette housing and set for the REC mode. 2) Connect a frequency counter as shown in Fig. 2-2-2.  **Fig. 2-2-2**

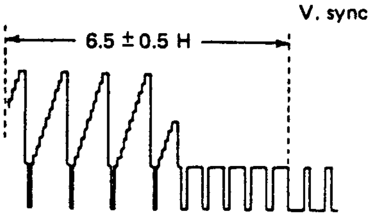
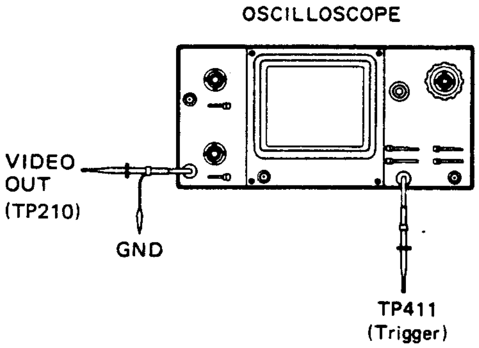
2.3 TIMER CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the TIMER board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Clock	IC1-16	C6 (clock)	•E-E	Note: *For below adjustments use 1 : 1 probe with input capacitance less than 100 pF.* 1) Disconnect VCR from AC. 2) Connect a frequency counter between IC1-16 and GND. 3) Short TP1 to GND, then short the leads of capacitor C3 once in order to reset IC1. 4) Connect VCR to AC. All FDP segments and power LED are on. 5) Adjust C6 for 2048.000±0.002 Hz (488.2808 to 488.2818 μs).

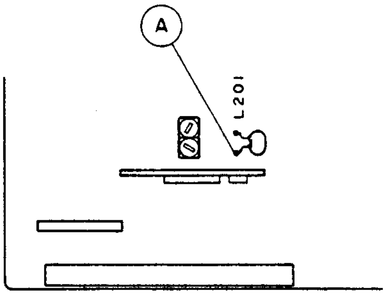
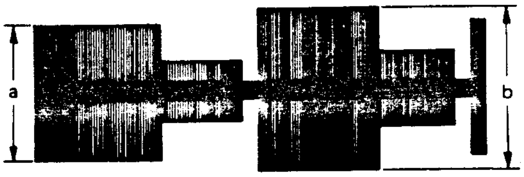
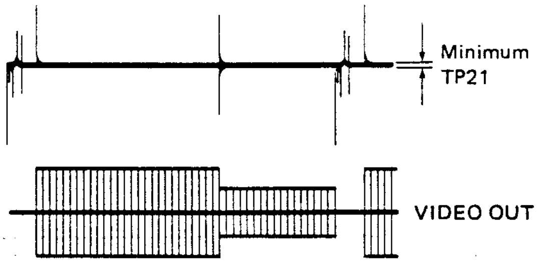
2.4 SERVO CIRCUIT

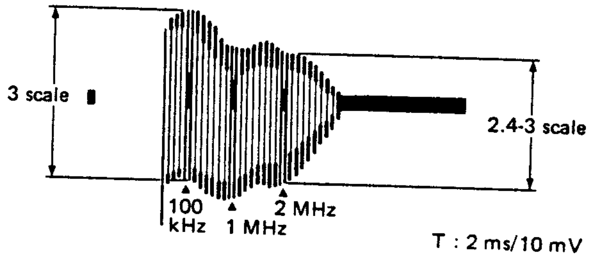
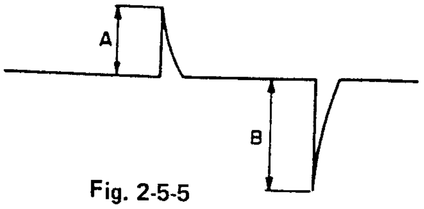
Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	SP PB switching point	VIDEO OUT (TP210)	R420 (SP SW. P)	•PB •MH-2 (stairstep) •Trigger slope (–) •SP mode •AUTO TRACKING OFF	1) Connect an oscilloscope to VIDEO OUT (TP 210). 2) Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411. 4) Adjust R420 to position the trigger point 6.5 ± 0.5H from V. sync.
			 Fig. 2-4-1 PB Switching Point		
2	SP slow tracking preset	Monitor-TV	Presetting unit (PTU 94008)	• SP mode • REC then PB (Slow ±1/6)	Note: *Set VCR to A mode by remote controller.* 1) Set recording video tape into the cassette housing. 2) Receive a colour broadcast on a VHF-HI channel or supply a colour bar signal to VIDEO IN. 3) Record a colour broadcast or colour bar signal in the SP mode. 4) Play back recorded signal in the FWD and REV slow mode and set the tracking control of the FRONT panel to the center position by simultaneously pressing the (+) and (–) tracking buttons. 5) Observe the display on a monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B (–)" or "C (+)" buttons of presetting unit as required. 6) Depress the STOP button on the FRONT panel. 7) Confirm that the bar noise is not visible on the monitor in the FWD slow mode. INFORMATION In the REV slow mode, the bar noise is visible on the monitor when tape motion.

2.5 VIDEO CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	REC colour level and ch balance	L201- Ⓐ (VIDEO UNIT board)	R220 (SP Rec colour level) (Main board)	• PB mode • MH-2 colour bar • SP mode • AUTO tracking : OFF	1) Connect an oscilloscope to L201- Ⓐ (IC201-19) pin as shown in Fig. 2-5-1 and observe colour signal level. 2) Set the MH-2 alignment tape into the cassette housing, play back the colour bar segment of MH-2 alignment tape. 3) Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "–" tracking buttons. 4) Adjust by pressing the "+" and "–" tracking buttons of the Front panel for maximum level of the colour waveform and make a note of the higher colour level "A". 5) Press the STOP button on the FRONT panel and eject the MH-2 alignment tape.
	 Fig. 2-5-1 Component view of VIDEO UNIT board				
	 Fig. 2-5-2 REC color level			• REC then PB • Colour bar signal • Auto tracking : OFF • SP mode	6) Set recording video cassette into the cassette housing. Supply a colour bar signal to VIDEO IN. 7) Trigger the oscilloscope externally with the signal from TP411 (DRUM FF) of the Main board. Use (–) trigger for CH1 and (+) trigger for CH2. 8) Record a colour bar signal in the SP mode. 9) Play back recorded colour bar signal. Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "–" tracking buttons and confirm 85 ± 5% of the noted colour level at IC201-19. If necessary, before recording, adjust R220 so that the higher level channel becomes 85 ± 5% of the noted level "A" during playback as shwon in Fig. 2-5-2. At this time, confirm that the channel level difference is within 3 dB. Note: *Repeat the above step (9) several times.*
2	YNR NC balance	TP21 (IC1-26) (VIDEO UNIT board)	R16 (NC BAL) (VIDEO UNIT board)	• E-E • INPUT SEL: AUX • Colour bar • SP mode	1) Supply a colour bar signal to VIDEO IN and connect an oscilloscope to TP21 (IC1-26 pin). 2) Adjust R16 for minimum DC step difference.
	 Fig. 2-5-3				

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
3	SP PB Frequency  Fig. 2-5-4 PB frequency	VIDEO OUT (TP201)	R226 (PB EQ)	• REC then PB • Video sweep • Auto tracking off	1) Terminate VIDEO OUT with monitor - TV (75 Ω load), supply a video sweep signal without burst to VIDEO IN. 2) Set recording video cassette into the cassette housing. Record a video sweep signal without burst in the SP mode. 3) Connect an oscilloscope to VIDEO OUT. Play back recorded video sweep signal in the SP mode, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (–) tracking buttons. 4) Use the control of the oscilloscope to position the 100 kHz region at graduation 3 (0 dB) of the oscilloscope scale. 5) Adjust R226 to position the 2 MHz of channel-1 portion at 2.4 – 3.0 (–1 ± 1 dB) of the oscilloscope graduations as shown in Fig. 2-5-4. At this time, confirm that the channel difference is within 3 dB.
			R226	• REC then PB • TV broadcast • Auto tracking off	**Alternate method** 1) Set recording video cassette into the cassette housing, receive a colour broadcast on a VHF channel. 2) Record a colour broadcast that shows a good depiction of human facial contours. 3) Play back recorded colour broadcast, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (–) tracking buttons. 4) Adjust R226 to obtain distinct facial features on the monitor. **Note:** *R226 nearly at centre position.*
4	Secam det	IC251-18 (Video unit board)	LC251 (Video unit board)	• EE • SECAM colour bar	1) Connect an oscilloscope to IC251-18. 2) Adjust LC251 so that A and B are related as follows: A : B = 3 : 3.8±0.2 ≒ 0.84 Vp-p : 1.11 Vp-p  Fig. 2-5-5

2.6 AUDIO CIRCUIT

Notes: *1. Unless otherwise specified, all test points and adjustments are located on the AUDIO board.*
2. Set the AUDIO LIMITER SW to ON position to obtain –6 dBs±0.5 dBs at AUDIO OUT.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio Bias Level	TP31 (+) TP32 (–)	R9	• SOURCE Select: AUX • SP mode • REC mode • No signal	1) Connect a millivoltmeter between TP31 and TP32. 2) Set for REC mode without incoming signal. 3) Adjust R9 for 1.9 mVrms.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
2	E-E level	AUDIO OUT	R40 (CH1/L)	• SOURCE Select: AUX • Limiter SW to OFF (AUS) • AUDIO OUT to Hi-Fi • E-E	1) Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, −8 dBs audio signal via A/V CONN. (both channels). 2) Set Hi-Fi REC controls to center position. In the STOP (E-E) mode, adjust R40 to obtain −6 ±0.5 dBs at AUDIO OUT.
			R41 (CH2/R)		3) In the same manner, adjust R41 for the R (CH2) channel.
3	Level indicator	FDP (Level ind.)	R73 (Indicator CH1/L)	• AUX • AUDIO OUT to Hi-Fi • Limiter SW to OFF (AUS)	**Note:** ***Perform the level indicator adjustment after completing the E-E level adjustment (section 2.6, No. 2)*** 1) Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, −8 dBs audio signal via A/V CONN. (both channels) 2) Set Hi-Fi REC controls to center position. In the E-E (STOP) mode, adjust R73 to where the FDP level indicators show 0 dB (all white LEDs light).
			R74 (Indicator CH2/R)		3) In the same manner, adjust R74 for the R (CH2) channel.

2.7 TUNER/IF CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the TUNER/IF board.*

Equipment required:

1. Oscilloscope
2. IF sweep signal genrator with suitable markers (PIF, etc.)
3. Sweeper probe (sweep signal supply cable) as shown below.

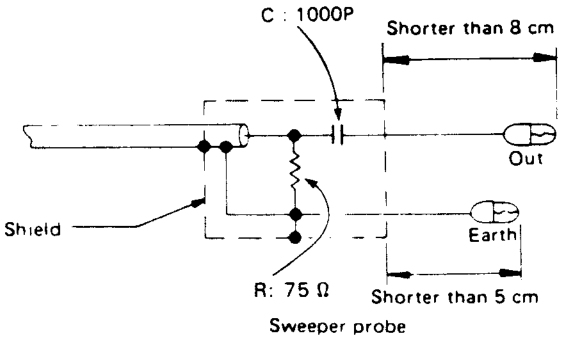
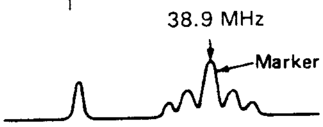
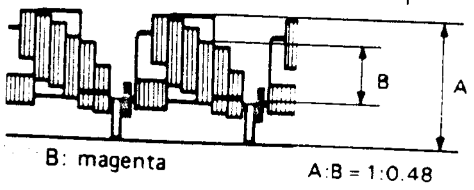


Fig. 2-7-1

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	VCO  VCO and sweep signal (beat) Fig. 2-7-2	IC1-28	T2 (VCO)	• Sweep genrator out: 70 dBμ (38.9 MHz) • Tuner mode without antenna IN	1) Use a sweeper probe as shown in Fig. 2-7-1 and connect the sweep generator output to pin 1 of SAW 1. Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope. Connect the oscilloscope to pin 28 of IC1 (VIDEO DET OUT) and adjust T2 to align the waveform with the frequency marker as shown in Fig. 2-7-2.
				• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a colour broadcast on a UHF. 2) Adjust T2 to obtain a fine picture on the monitor.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
● Before the following adjustments: 1. Connect a cable to ANT IN and terminate TV OUT at 75 Ω. 2. Set a TV channel signal generator as follows. Video : 65 dBμ/75 Ω, colour bar 87.5% modulation Audio : 55 dBμ/75 Ω, 1 kHz ± 50 kHz deviation					
2	RF AGC	IF terminal of Front end	R21	• TV signal • Tuner mode	1) Connect the oscilloscope to IF terminal of U/V Tuner (Front end). Adjust R21 for maximum level, then again adjust R21 for –8 dB again.
		MONITOR	R21	• TV broadcast • Tuner mode	**Alternate method:** Note: *Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occurs due to strong electrical fields.* 1) Adjust R21 to minimize noise or streaks on the TV screen. 2) Check for absence of abnormality on all channels.
3	Colour Level	CN1-4 (VIDEO OUT) TUNER CTL board	R40	• TV signal • Tuner mode • Colour bar	1) Receiving a colour bar signal. Set the Y level for 100% reference signal and then adjust R40 for a magenta level of 48% at pin 4 of CN1.
	 Fig. 2-7-3				
				• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a color broadcast on a UHF. 2) Adjust R40 so that the magenta level becomes 2/3% of the sync. level.
4	Sync det	Across C33	T5 (Sync det)	• TV broadcast • Tuner mode	1) Receive a colour broadcast on a UHF. Connect oscilloscope across C33. 2) Set the oscilloscope to DC mode Adjust T5 to obtain maximum level.

2.8 ON SCREEN CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Character Position	TP901	C905 (CHARA POSI)	• E-E	**Note:** *For below adjustments use 1 : 1 probe with input capacitance less than 100 pF.* 1) Connect a frequency counter to TP901 and GND. Short IC901-3 pin to GND and short IC901-30 pin to IC901-32 pin (SWD 5 V). 2) Adjust C905 for 7.30 ± 0.05 MHz without video signal.
2	Back ground Colour	TP902	C916 (BACK COLOUR)	• E-E	1) Connect a frequency counter to TP902 and GND. 2) Adjust C916 for 17.73447 ± 0.00030 MHz.

2.9 DEMODULATOR CIRCUIT

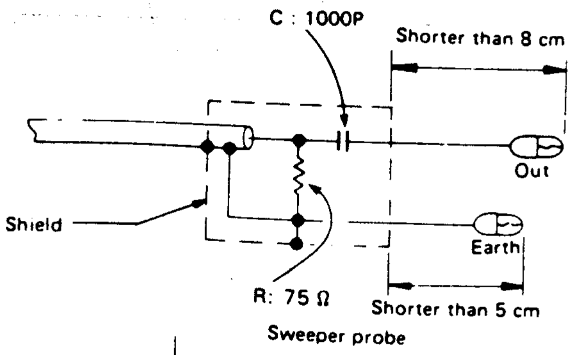
Note: Unless otherwise noted, all test points and adjustments are located on the DEMODULATOR board.

Audio Multiplex TV Signal Generator

Recommanded Specifications

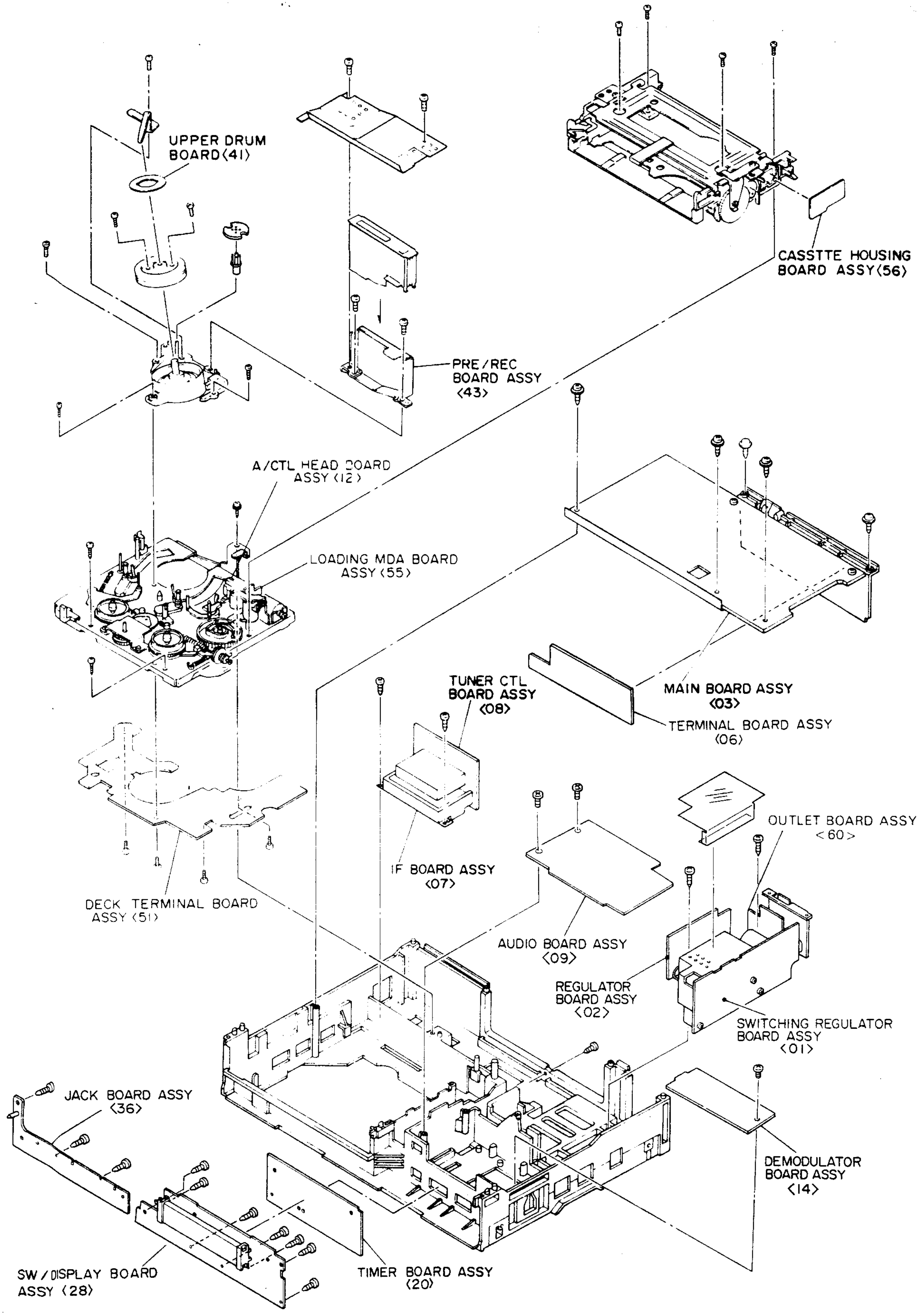
1. Signal Format	Based on CCIR-B
2. Frequency	
Video Carrier FV	38.9 MHz
1st Sound Carrier f_{s1}	33.4 MHz
2nd Sound Carrier f_{s2}	33.1578125 MHz
3. Modulator	
Video	Crosshatch (black on white) V: 50 Hz, H: 15.625 kHz
Audio	Sinewave 1 kHz; CH1 and CH-2 outputs switchable
4. Output	97 dB/μV (open)±2 dB fixed, BNC-R 75 Ω
5. P-S Ratio	S_1 P−13 dB±2 fixed S_2 P−20 dB±2 fixed
6. Modulation	
Video	87.5%±3%
Audio	±30 kHz±2 kHz
7. Stereo Separation	Less than −40 dB
8. Pilot Signal	
Carrier Frequency	54.6875 kHz±5 Hz synchronized type
Stereo	117.5 Hz AM 50%
Dual	274.1 Hz AM 50%

9. Sound Modulation Modes	S_1	S_2
Mono	Mono 1	Mono 2
Stereo	(L+R)/2	R
Dual	Mono 1	Mono 2
10. Functions	S_1	S_2
Mono (M)	100%	100%
Stereo (L, R)	(L+R)/2	R
(L)	L/2	–
(R)	R/2	R
(OFF)	–	–
Mult (S_1, S_2)	100%	100%
(S_1)	100%	0
(S_2)	0	100%
(OFF)	0	0
V. MOD (ON/OFF)		
11. Frequency Accuracy	Within $\pm 5\times10^{-5}$	
12. Spurious	Less than −50 dB	
13. Saw Filter	Self-contained	

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
	Equipment required: 1. Oscilloscope 2. Audio Multiplex TV Signal Generator 3. Sweeper probe (sweep signal supply cable) as shown below.				 C : 1000P Shorter than 8 cm Out Shield Earth R: 75 Ω Shorter than 5 cm Sweeper probe **Fig. 2-8-1**
1	First audio detector coil	IC1 Pin 3	T4 [IF PWB]	•BILING mode •SUB: unmod. •MAIN: mod.	1) Use a sweeper probe as shown in Fig. 2-8-1 and apply Main audio modulated signal to the front end IF terminal. 2) Connect a distortion meter to IC1 pin 3. 3) Adjust T4 of the IF board for minimum distortion. **Note:** Audio multiplex TV signal generator connection is the same for the following adjustments.
2	Second audio detector coil	IC1 pin 2	T1	•BILING mode •SUB: mod. •MAIN: unmod.	1) Connect a distortion meter to IC1 pin 2. 2) Adjust T1 for minimum distortion.
3	Stereo separation	IC1 pin 5	R2	•STEREO mode •R: mod. •L: unmod.	1) Set a signal generator to Stero mode, but adjust only the R channel. 2) Connect an oscilloscope to IC1 pin 5. 3) Adjust R2 for minimum output level.
4	Buzz	CN2 pin 2	T8, T2 [IF PWB]	•STEREO mode •R/L: unmod.	1) Connect a noise meter to CN2 pin 2 and an oscilloscope to AC output of the noise meter. 2) Adjust T8 of the IF board for minimum Philips pattern noise. 3) Adjust T2 of the IF board for minimum crosshatch noise.
5	Audio output level	CN2 pin 2(L) CN2 pin 4(R)	R21 (L) R24(R)	•STEREO mode •R: mod./unmod. •L: unmod./mod.	1) Set a signal generator for Stereo mode. 2) Connect a noise meter to CN2 pin 2. 3) Adjust R21 (L channel) for −18.0±0.5 dBs. 4) Similarly, connect a noise meter to pin 4 of CN2 and adjust R24 for the R channel.

SECTION 3
CHARTS AND DIAGRAMS

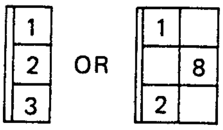
3.1 CIRCUIT BOARD AND LOCATION


UPPER DRUM BOARD<41>
CASSTTE HOUSING BOARD ASSY<56>
PRE/REC BOARD ASSY <43>
A/CTL HEAD BOARD ASSY <12>
LOADING MDA BOARD ASSY <55>
TUNER CTL BOARD ASSY <08>
MAIN BOARD ASSY <03>
TERMINAL BOARD ASSY <06>
OUTLET BOARD ASSY <60>
IF BOARD ASSY <07>
DECK TERMINAL BOARD ASSY <51>
AUDIO BOARD ASSY <09>
REGULATOR BOARD ASSY <02>
SWITCHING REGULATOR BOARD ASSY <01>
JACK BOARD ASSY <36>
DEMODULATOR BOARD ASSY <14>
SW/DISPLAY BOARD ASSY <28>
TIMER BOARD ASSY <20>

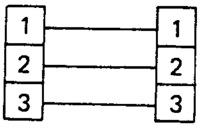
3.2 GENERAL INFORMATION

3.2.1 Connections

Note:
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.



: Connectors



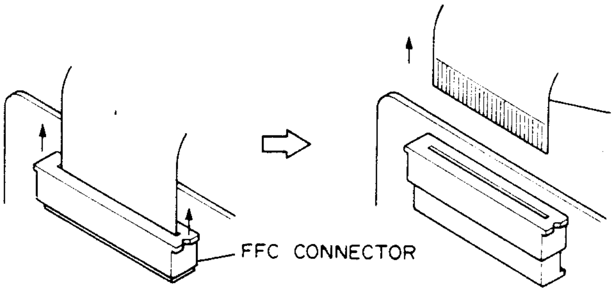
: Board in connectors

① ② ③ OR ○ ○ ○ : Direct connections

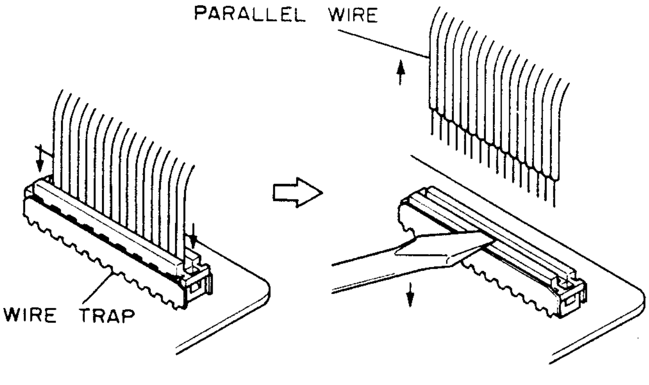
VS MS SM : Connected pattern in the board.
Abbreviations
V : Video M : Mechacon
S : Servo A : Audio
VS : Signal flow from video to servo.

3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

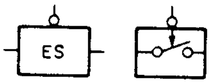


2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.

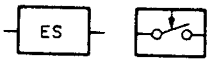


3.2.3 Indications

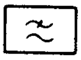
AUX : Active only at high.
$\overline{\text{AUX}}$: Active only at low.
$\bar{\text{A}}\bar{\text{U}}\bar{\text{X}}$: Active only at middle.
$\bar{\text{A}}\text{U}\bar{\text{X}}$: Active only at open.



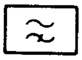
: Active only at low fo
electronic switch.



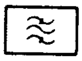
: Active only at high fc
electronic switch.



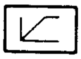
: Low pass filter.



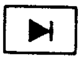
: High pass filter.



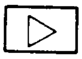
: Band pass filter.



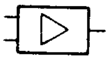
: Limiter.



: Detector



: Amplifier.



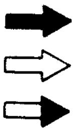
: Mixer stage.

3.2.4 Schematic diagram values

Unless otherwise specified.

1. All resistance values are in ohms, 1/6 W or 1/8 W to parts list).
2. All capacitance values are in μF, (P; PF).
3. All inductance values are in μH, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to par
5. Voltages are DC-measured (reference to ground) digital voltmeter during recording (SP mode) and p (SP mode) with alignment tape. Where voltage between recording and playback, the voltage playback is shown in parenthesis.
6. Waveforms (VIDEO System) are measured (refere ground) with a color bar during recording (SP mo playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (refere ground) with 1 kHz (−8 dBs) during recordin playback with alignment tape (1 kHz).
8. Shaded (   ) parts are critical for safety. Replace only with specified part numbers.

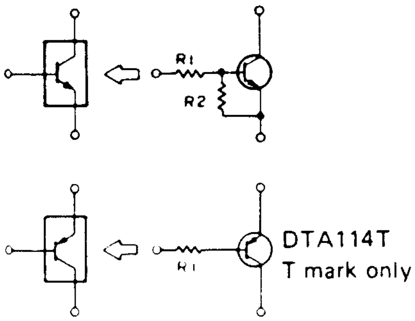
3.2.5 Signal flow in the schematic



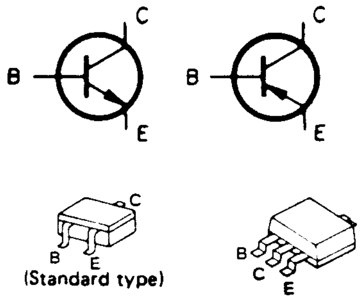
Recording signal path
Playback signal path
REC/PB signal path

3.2.6 Semiconductors

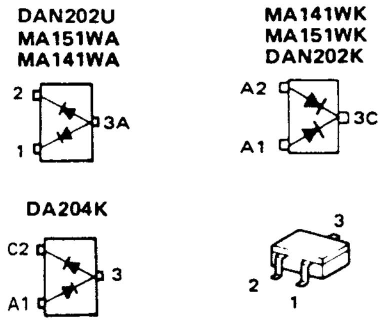
1. Digital transistor


R1
R2
R1
DTA114T
T mark only

2. Chip transistor


C
B
E
C
B
E
C
B
E
(Standard type)
B
C
E

3. Chip diode


DAN202U
MA151WA
MA141WA
2
1
3A
MA141WK
MA151WK
DAN202K
A2
A1
3C
DA204K
C2
A1
3
3
2
1

Note:
The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

Uses:
Inverter, Interface, driver circuits.

3.2.7 Replacement of chip parts

For replacing chip parts, proceed as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

Caution:
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

1. Soldered condition of chip parts

- Resistors, capacitors, etc.

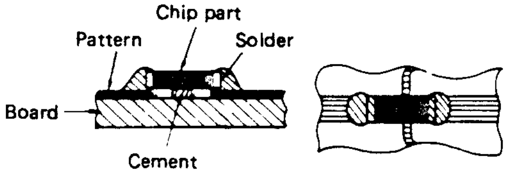

Chip part
Pattern
Solder
Board
Cement

Fig. 3-2-1 Soldering condition-1

- Transistors, diodes, etc.

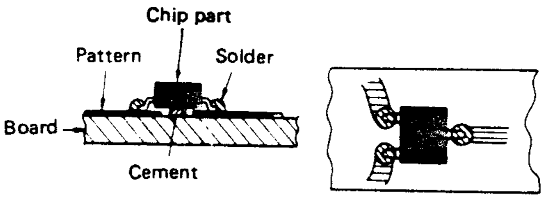

Chip part
Pattern
Solder
Board
Cement

Fig. 3-2-2 Soldering condition-2

2. How to remove chip parts

- Resistors, capacitors, etc.

1) Place a chip parts removal tool onto the chip part to hold it down.
2) Unsolder at each side of the chip part.

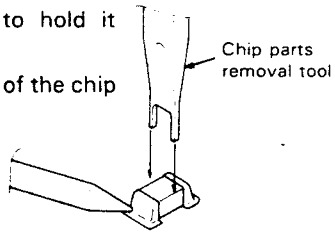

Chip parts removal tool

Fig. 3-2-3 R/C removal-1

3) Remove the chip part by twisting and sliding it.

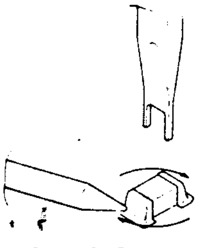


Fig. 3-2-4 R/C removal-2

3. How to remove transistors, diode.

1) Unsolder at the single lead side of the chip part.

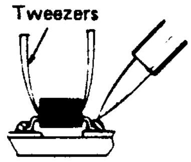


Fig. 3-2-5 Tr/Diode removal-1

2) Lift the unsoldered side upwards.

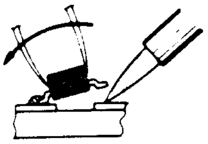


Fig. 3-2-6 Tr/Diode removal-2

3) Heat the other two leads simultaneously and remove the chip part upwards.

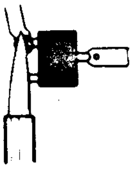


Fig. 3-2-7 Tr/Diode removal-3

4. Preheating and soldering

When placing new chip parts, especially capacitors, but not including transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before soldering. For soldering, use a soldering iron of 30 W approx.

5. How to place and solder chip parts

1) Presolder the contact points of the circuit pattern, to which the chip parts will be soldered.

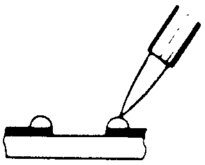


Fig. 3-2-8 Soldering-1

2) While holding down the chip part with the chip part removal tool, solder it with a soldering iron.

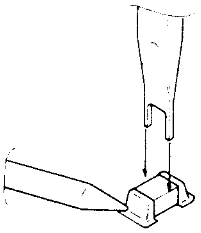


Fig. 3-2-9 Soldering-2

3. How to remove transistors, diode.

1) Unsolder at the single lead side of the chip part.

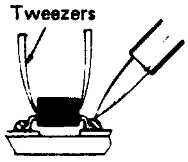


Fig. 3-2-5 Tr/Diode removal-1

2) Lift the unsoldered side upwards.

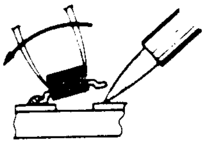


Fig. 3-2-6 Tr/Diode removal-2

3) Heat the other two leads simultaneously and remove the chip part upwards.

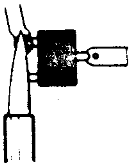


Fig. 3-2-7 Tr/Diode removal-3

4. Preheating and soldering

When placing new chip parts, especially capacitors, but not including transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before soldering. For soldering, use a soldering iron of 30 W approx.

5. How to place and solder chip parts

1) Presolder the contact points of the circuit pattern, to which the chip parts will be soldered.

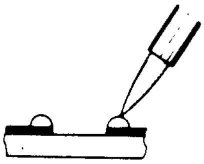


Fig. 3-2-8 Soldering-1

2) While holding down the chip part with the chip part removal tool, solder it with a soldering iron.

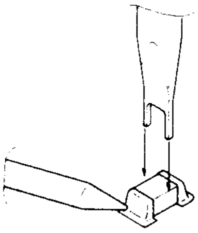
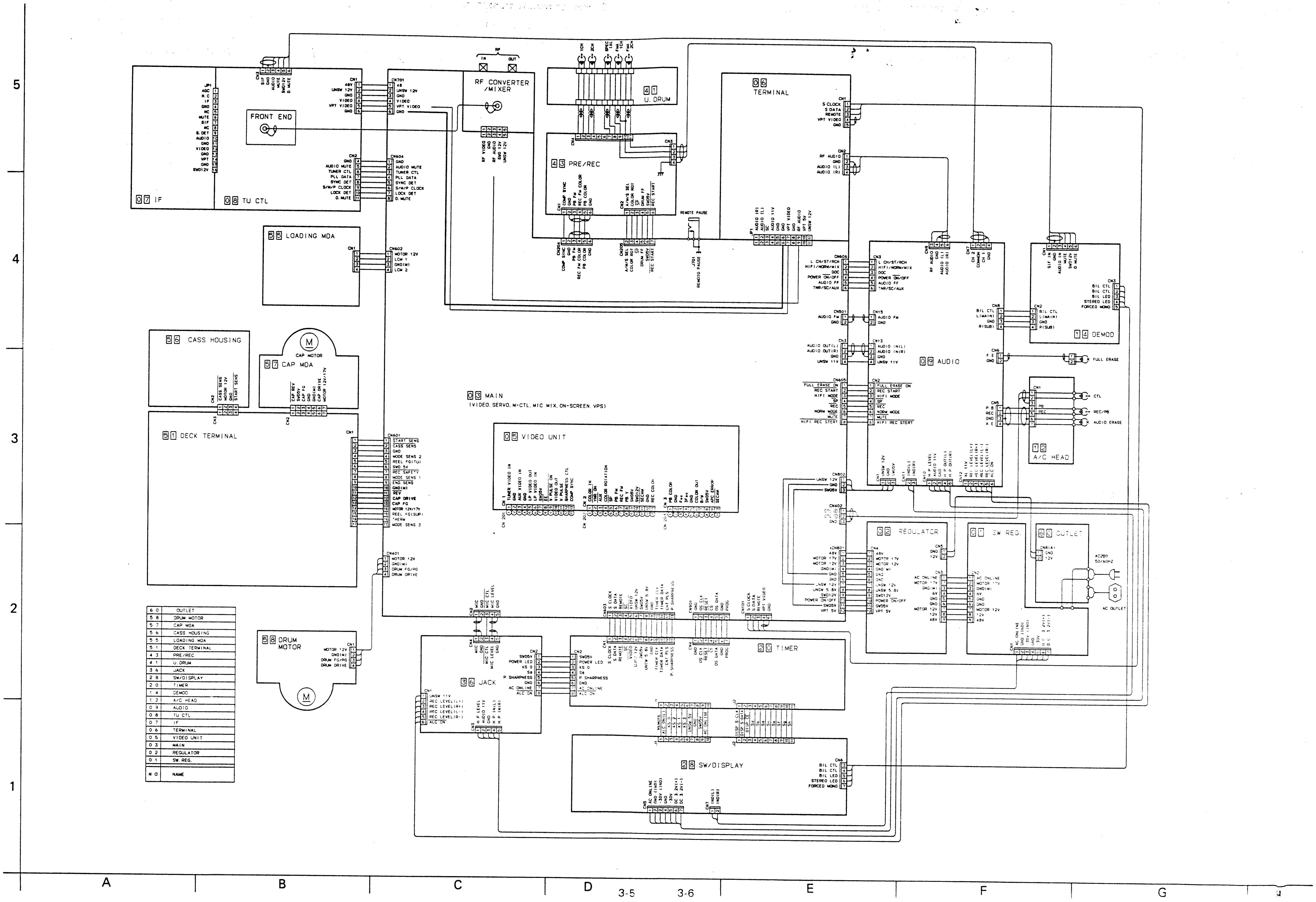


Fig. 3-2-9 Soldering-2

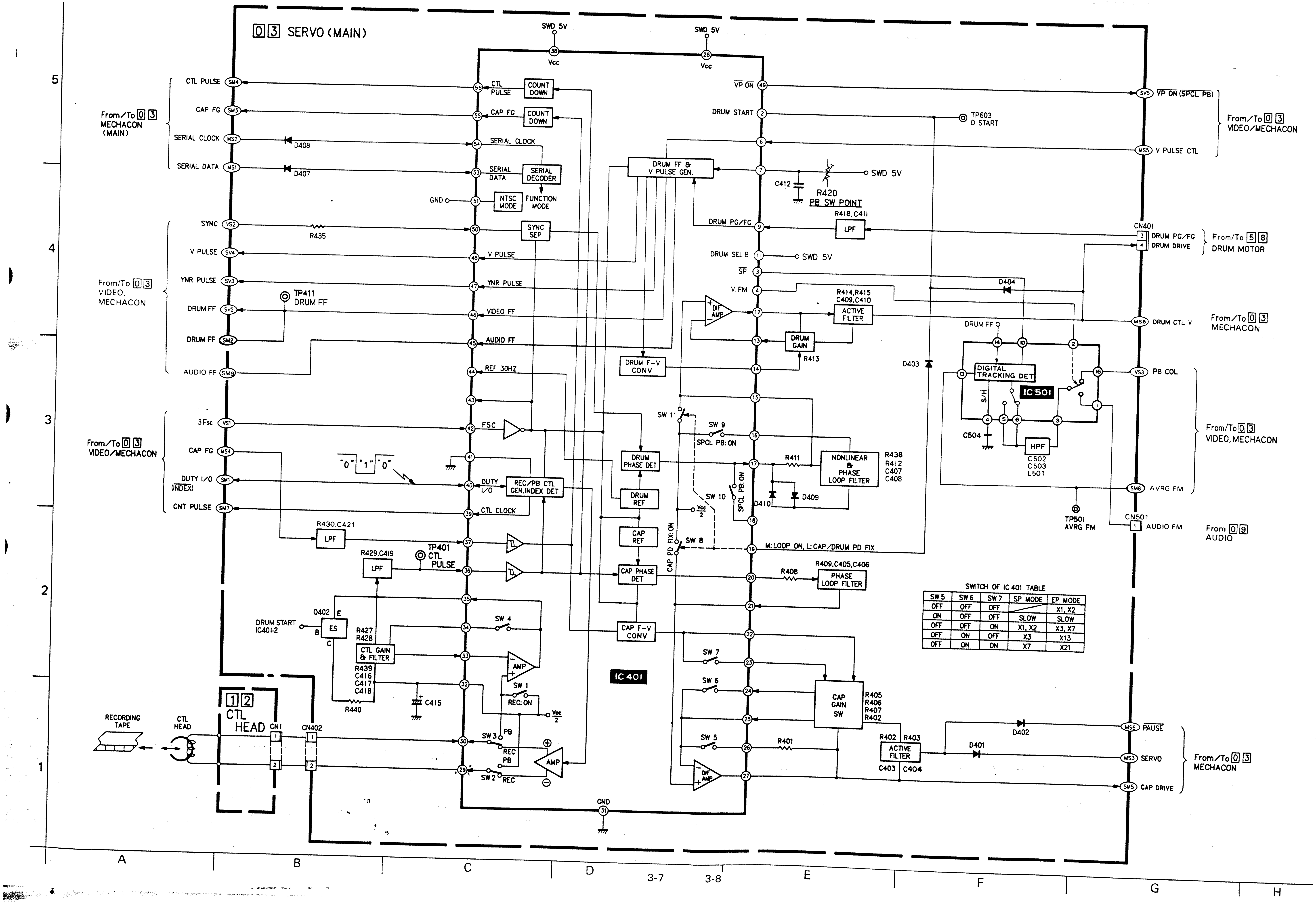
3.3 BOARD INTERCONNECTIONS



07 IF
08 TU CTL
FRONT END
RF CONVERTER /MIXER
RF IN OUT
41 U. DRUM
43 PRE/REC
06 TERMINAL
55 LOADING MDA
56 CASS HOUSING
57 CAP MDA
CAP MOTOR
51 DECK TERMINAL
03 MAIN
(VIDEO, SERVO, M-CTL, MIC MIX, ON-SCREEN, VPS)
05 VIDEO UNIT
09 AUDIO
14 DEMOD
12 A/C HEAD
FULL ERASE
CTL
REC/PB
AUDIO ERASE
02 REGULATOR
01 SW REG.
60 OUTLET
AC220 50/60HZ
AC OUTLET
58 DRUM MOTOR
36 JACK
20 TIMER
28 SW/DISPLAY
REMOTE PAUSE
5
4
3
2
1
A
B
C
D
E
F
G

NO	NAME
60	OUTLET
58	DRUM MOTOR
57	CAP MDA
56	CASS HOUSING
55	LOADING MDA
51	DECK TERMINAL
43	PRE/REC
41	U. DRUM
36	JACK
28	SW/DISPLAY
20	TIMER
14	DEMOD
12	A/C HEAD
09	AUDIO
08	TU CTL
07	IF
06	TERMINAL
05	VIDEO UNIT
03	MAIN
02	REGULATOR
01	SW. REG.

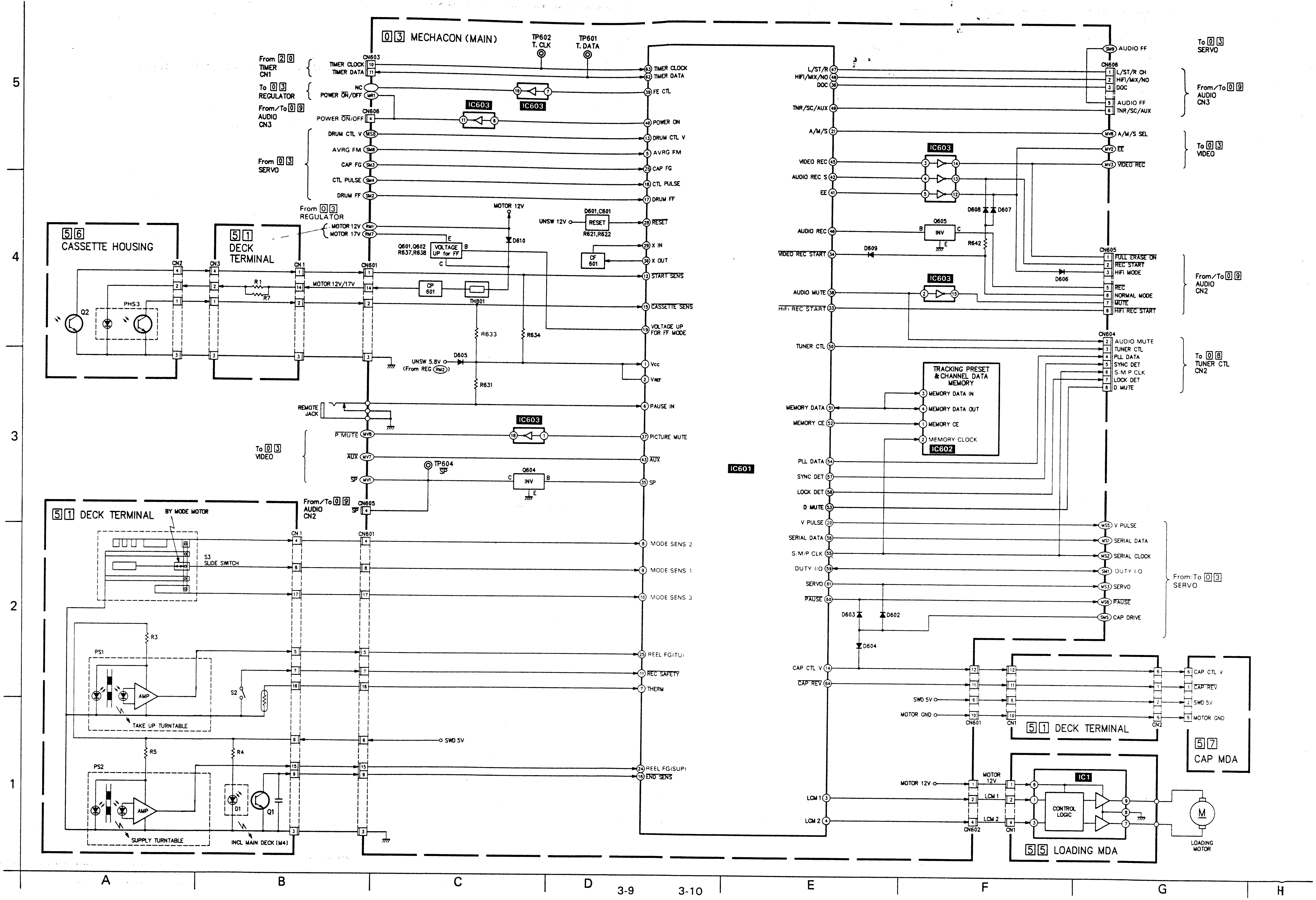
3.4 SERVO BLOCK DIAGRAM


03 SERVO (MAIN)
SWD 5V
Vcc
From/To 03 MECHACON (MAIN)
CTL PULSE
CAP FG
SERIAL CLOCK
SERIAL DATA
SM4
SM3
MS2
MS1
D408
D407
COUNT DOWN
SERIAL DECODER
FUNCTION MODE
NTSC MODE
GND
SYNC
R435
SYNC SEP
V PULSE
YNR PULSE
DRUM FF
AUDIO FF
VIDEO FF
REF 30HZ
TP411 DRUM FF
From/To 03 VIDEO, MECHACON
VS2
SV4
SV3
SV2
SM2
SM9
3Fsc
CAP FG
DUTY I/O (INDEX)
CNT PULSE
VS1
MS4
SM1
SM7
From/To 03 VIDEO/MECHACON
FSC
"0" "1" "0"
DUTY I/O
REC/PB CTL GEN.INDEX DET
CTL CLOCK
R430,C421
LPF
R429,C419
TP401 CTL PULSE
Q402
DRUM START IC401-2
ES
R427 R428
CTL GAIN & FILTER
R439 C416 C417 C418
R440
C415
SW 4
AMP
SW 1
REC: ON
Vcc/2
RECORDING TAPE
CTL HEAD
12 CTL HEAD
CN1
CN402
SW 3 PB REC
SW 2 PB REC
AMP
GND
IC 401
VP ON
DRUM START
DRUM FF & V PULSE GEN.
C412
R420 PB SW POINT
SWD 5V
TP603 D.START
DRUM PG/FG
R418,C411
LPF
DRUM SEL B
SP
V.FM
DIF AMP
R414,R415 C409,C410
ACTIVE FILTER
DRUM GAIN
R413
DRUM F-V CONV
SW 11
SW 9
SPCL PB:ON
DRUM PHASE DET
DRUM REF
CAP REF
CAP PHASE DET
CAP F-V CONV
SW 10
SPCL PB:ON
CAP PD FIX:ON
SW 8
R411
NONLINEAR & PHASE LOOP FILTER
R438 R412 C407 C408
D410
D409
M: LOOP ON, L: CAP/DRUM PD FIX
R408
R409,C405,C406
PHASE LOOP FILTER
SW 7
SW 6
SW 5
CAP GAIN SW
R405 R406 R407 R402
R401
DIF AMP
R402 R403
ACTIVE FILTER
C403 C404
D402
D401
D403
D404
SV5
VP ON (SPCL PB)
MS5
V PULSE CTL
From/To 03 VIDEO/MECHACON
CN401
DRUM PG/FG
DRUM DRIVE
From/To 58 DRUM MOTOR
DRUM FF
DIGITAL TRACKING DET
IC501
S/H
C504
HPF
C502 C503 L501
MS8
DRUM CTL V
From/To 03 MECHACON
VS3
PB COL
SM8
AVRG FM
From/To 03 VIDEO, MECHACON
TP501 AVRG FM
CN501
AUDIO FM
From 09 AUDIO
MS6
PAUSE
MS3
SERVO
SM5
CAP DRIVE
From/To 03 MECHACON
A
B
C
D
E
F
G
H
1
2
3
4
5

SWITCH OF IC 401 TABLE

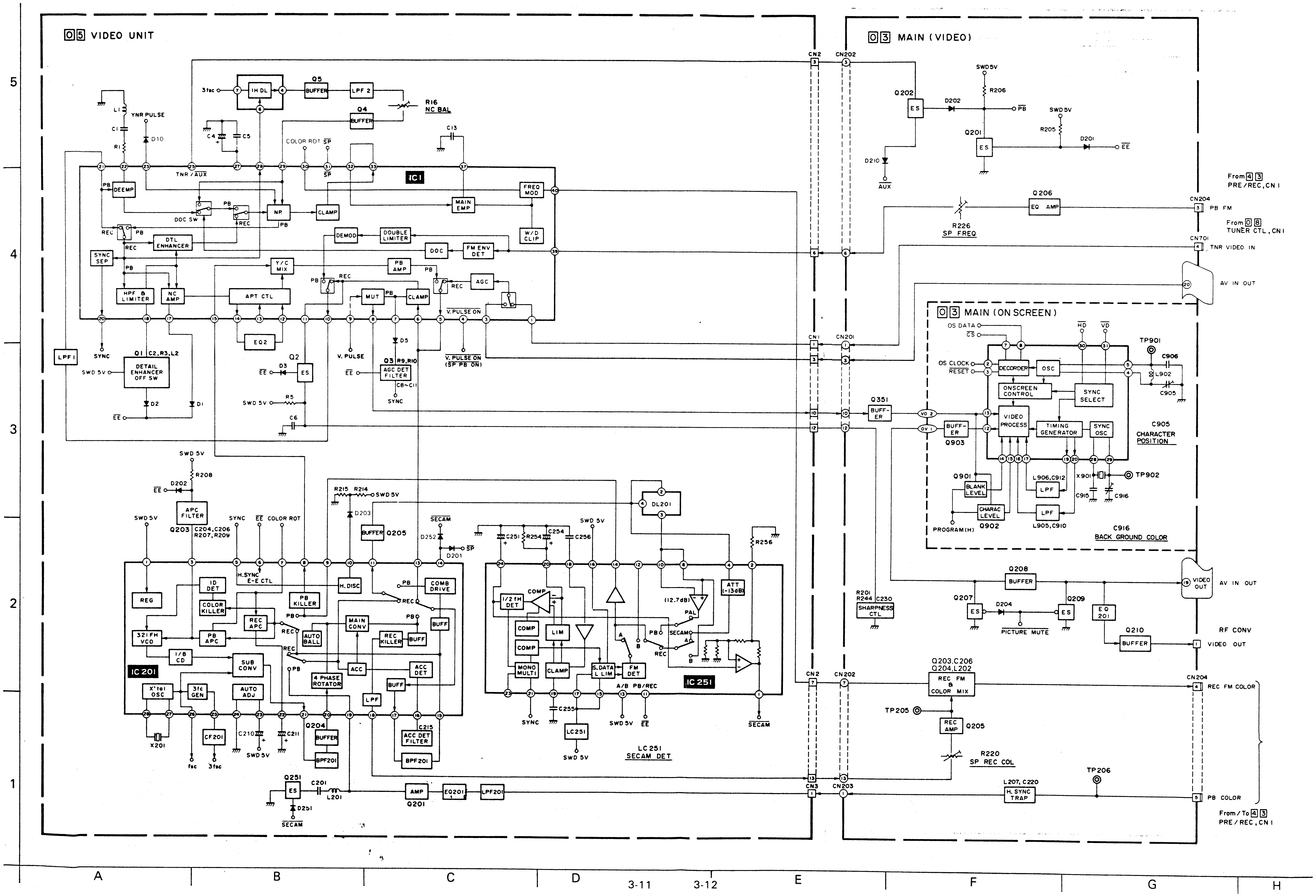
SW 5	SW 6	SW 7	SP MODE	EP MODE
OFF	OFF	OFF		X1, X2
ON	OFF	OFF	SLOW	SLOW
OFF	OFF	ON	X1, X2	X3, X7
OFF	ON	OFF	X3	X13
OFF	ON	ON	X7	X21

3.5 SYSTEM CTL BLOCK DIAGRAM

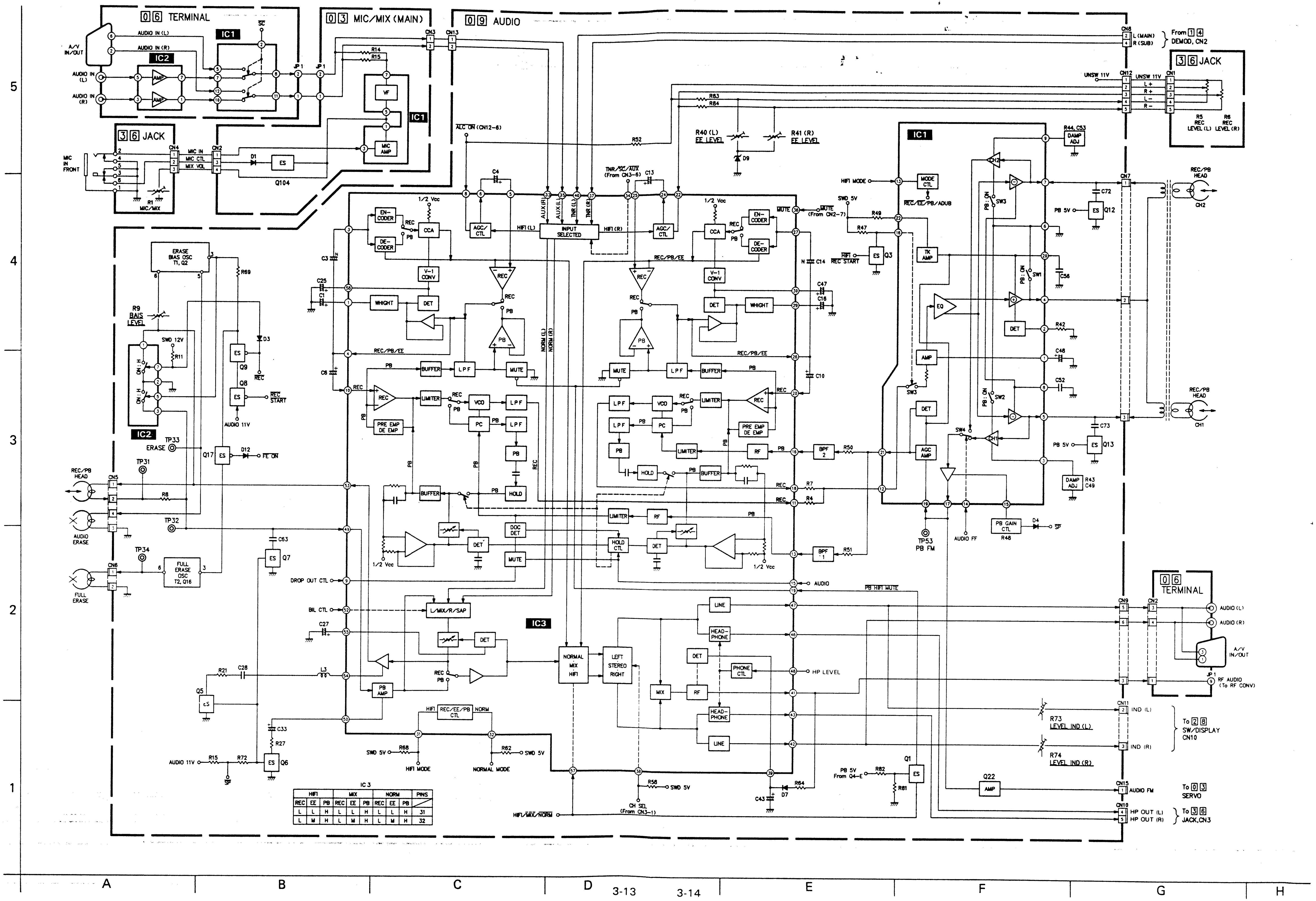


03 MECHACON (MAIN)
TP602 T. CLK
TP601 T. DATA
From 20 TIMER CN1
TIMER CLOCK
TIMER DATA
CN603
To 03 REGULATOR
NC
POWER ON/OFF
From/To 09 AUDIO CN3
CN606
POWER ON/OFF
IC603
From 03 SERVO
DRUM CTL V
AVRG FM
CAP FG
CTL PULSE
DRUM FF
From 03 REGULATOR
MOTOR 12V
MOTOR 17V
MOTOR 12V
D610
UNSW 12V
D601,C601
RESET
R621,R622
Q601,Q602 R637,R638
VOLTAGE UP for FF
CF 601
56 CASSETTE HOUSING
51 DECK TERMINAL
CN2
CN3
CN1
CN601
R1
R7
MOTOR 12V/17V
CP 601
TH801
PHS3
Q2
R633
R634
D605
UNSW 5.8V
(From REG RM2)
R631
REMOTE JACK
To 03 VIDEO
P MUTE
AUX
SP
TP604 SP
Q604
INV
From/To 09 AUDIO CN2
CN605
SP
51 DECK TERMINAL
BY MODE MOTOR
S3 SLIDE SWITCH
R3
PS1
AMP
TAKE UP TURNTABLE
S2
R5
R4
PS2
D1
Q1
SUPPLY TURNTABLE
INCL MAIN DECK (M4)
SWD 5V
TIMER CLOCK
TIMER DATA
FE CTL
POWER ON
DRUM CTL V
AVRG FM
CAP FG
CTL PULSE
DRUM FF
RESET
X IN
X OUT
START SENS
CASSETTE SENS
VOLTAGE UP FOR FF MODE
Vcc
VREF
PAUSE IN
PICTURE MUTE
AUX
SP
MODE SENS 2
MODE SENS 1
MODE SENS 3
REEL FG(TU)
REC SAFETY
THERM
REEL FG(SUP)
END SENS
IC601
L/ST/R
HIFI/MIX/NO
DOC
TNR/SC/AUX
A/M/S
VIDEO REC
AUDIO REC S
EE
D608
D607
AUDIO REC
Q605
INV
R642
VIDEO REC START
D609
D606
AUDIO MUTE
HiFi REC START
TUNER CTL
TRACKING PRESET & CHANNEL DATA MEMORY
MEMORY DATA IN
MEMORY DATA OUT
MEMORY CE
MEMORY CLOCK
IC602
MEMORY DATA
MEMORY CE
PLL DATA
SYNC DET
LOCK DET
D MUTE
V PULSE
SERIAL DATA
S.M.P CLK
DUTY I/O
SERVO
PAUSE
D603
D602
D604
CAP CTL V
CAP REV
SWD 5V
MOTOR GND
CN601
CN1
51 DECK TERMINAL
CN2
57 CAP MDA
CAP CTL V
CAP REV
SWD 5V
MOTOR GND
MOTOR 12V
LCM 1
LCM 2
CN602
MOTOR 12V
IC1
CONTROL LOGIC
55 LOADING MDA
M
LOADING MOTOR
AUDIO FF
To 03 SERVO
L/ST/R CH
HIFI/MIX/NO
DOC
AUDIO FF
TNR/SC/AUX
From/To 09 AUDIO CN3
A/M/S SEL
EE
VIDEO REC
To 03 VIDEO
CN605
FULL ERASE ON
REC START
HIFI MODE
REC
NORMAL MODE
MUTE
HIFI REC START
From/To 09 AUDIO CN2
CN604
AUDIO MUTE
TUNER CTL
PLL DATA
SYNC DET
S.M.P CLK
LOCK DET
D MUTE
To 08 TUNER CTL CN2
V PULSE
SERIAL DATA
SERIAL CLOCK
DUTY I/O
SERVO
PAUSE
CAP DRIVE
From/To 03 SERVO
A
B
C
D
E
F
G
H
1
2
3
4
5

3.6 VIDEO BLOCK DIAGRAM


05 VIDEO UNIT
03 MAIN (VIDEO)
03 MAIN (ON SCREEN)
IC1
IC201
IC251
1H DL
3fsc
Q5 BUFFER
LPF 2
Q4 BUFFER
R16 NC BAL
C13
YNR PULSE
L1
C1
R1
D10
C4
C5
COLOR ROT SP
TNR / AUX
SP
DEEMP
DOC SW
NP
CLAMP
MAIN EMP
FREQ MOD
W/D CLIP
DEMOD
DOUBLE LIMITER
DOC
FM ENV DET
DTL ENHANCER
SYNC SEP
Y/C MIX
PB AMP
AGC
HPF & LIMITER
NC AMP
APT CTL
MUT
EQ2
V.PULSE ON
V. PULSE
V.PULSE ON (SP PB ON)
SYNC
Q1 C2,R3,L2
DETAIL ENHANCER OFF SW
LPF1
SWD 5V
EE
D1
D2
D3
Q2 ES
R5
C6
Q3 R9,R10
AGC DET FILTER
C8~C11
D5
PB
REC
R208
D202
APC FILTER
Q203 C204,C206 R207,R209
REG
ID DET
COLOR KILLER
REC APC
PB APC
321FH VCO
1/8 CD
SUB CONV
X'tal OSC
3fc GEN
AUTO ADJ
X201
CF201
fsc
C210
C211
H.SYNC E-E CTL
PB KILLER
AUTO BALL
MAIN CONV
REC KILLER
BUFF
H. DISC
COMB DRIVE
4 PHASE ROTATOR
ACC
ACC DET
LPF
Q204 BUFFER
BPF201
C215
ACC DET FILTER
R215 R214
D203
BUFFER Q205
SECAM
D252
D201
DL201
C251
R254
C254
C256
R256
1/2 fH DET
COMP
LIM
MONO MULTI
S. DATA L LIM
FM DET
ATT (-13dB)
(12.7dB)
PAL
A/B PB/REC
C255
LC251
LC 251 SECAM DET
Q251 ES
C201
L201
D251
AMP
Q201
EQ201
LPF201
CN2
CN202
CN1
CN201
CN3
CN203
SWD5V
Q202 ES
D202
R206
PB
R205
Q201 ES
D201
D210
AUX
Q206 EQ AMP
R226 SP FREQ
CN204
PB FM
From 43 PRE/REC, CN1
From 08 TUNER CTL, CN1
CN701
TNR VIDEO IN
AV IN OUT
OS DATA
CS
HD
VD
TP901
C906
OS CLOCK
RESET
DECORDER
OSC
L902
C905
ONSCREEN CONTROL
SYNC SELECT
Q351 BUFF-ER
VO 2
OV 1
BUFF-ER
Q903
VIDEO PROCESS
TIMING GENERATOR
SYNC OSC
C905 CHARACTER POSITION
Q901
BLANK LEVEL
L906,C912
X901
TP902
LPF
C915
C916
CHARAC LEVEL
PROGRAM(H)
Q902
L905,C910
C916 BACK GROUND COLOR
R201 R244 C230
SHARPNESS CTL
Q208 BUFFER
VIDEO OUT
Q207 ES
D204
Q209 ES
PICTURE MUTE
EQ 201
Q210 BUFFER
RF CONV
VIDEO OUT
Q203,C206 Q204,L202
REC FM & COLOR MIX
TP205
REC AMP
Q205
R220 SP REC COL
REC FM COLOR
TP206
L207, C220
H. SYNC TRAP
PB COLOR
From/To 43 PRE/REC, CN1
A
B
C
D
E
F
G
H
1
2
3
4
5

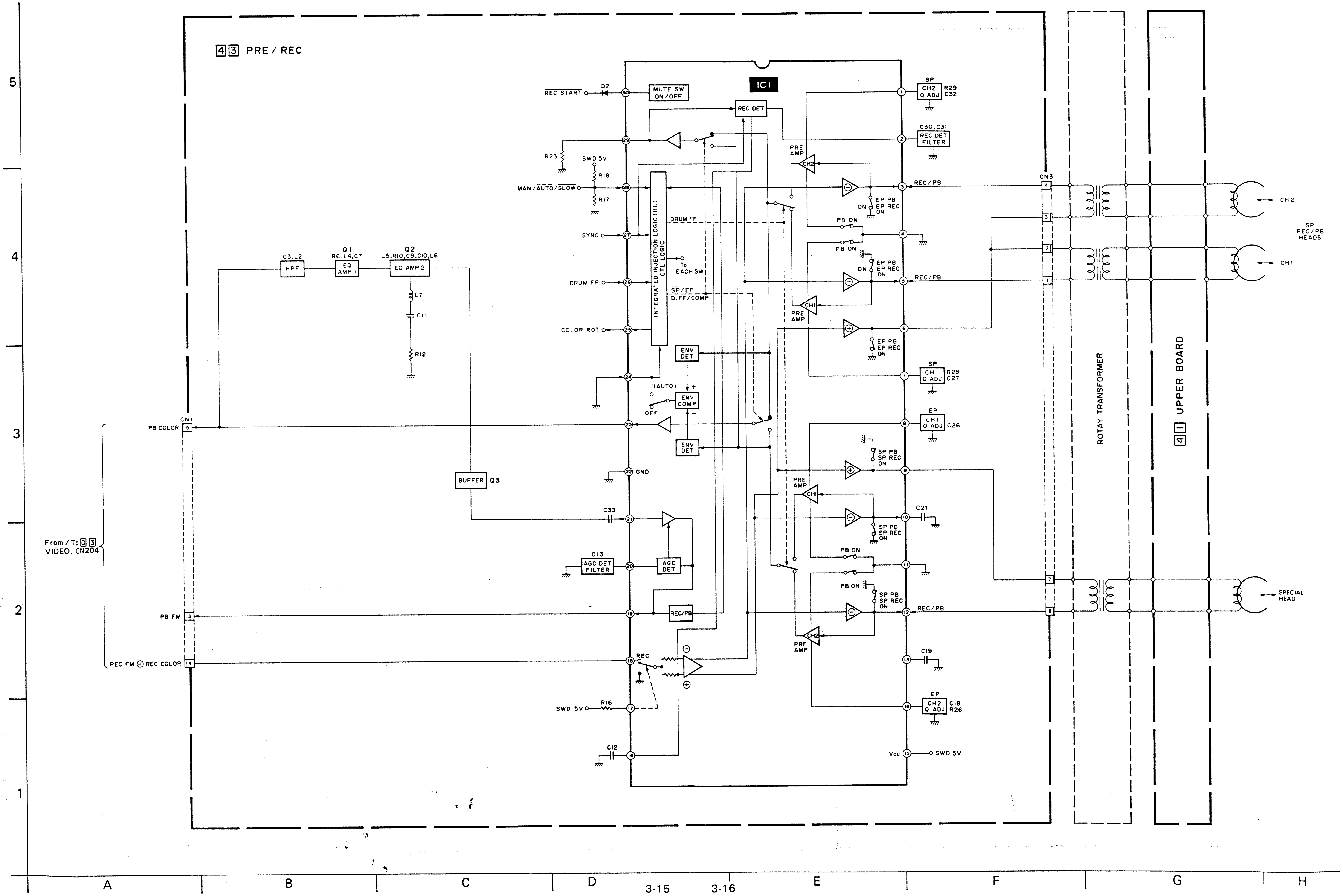
3.7 AUDIO BLOCK DIAGRAM


06 TERMINAL
03 MIC/MIX (MAIN)
09 AUDIO
36 JACK
A/V IN/OUT
AUDIO IN (L)
AUDIO IN (R)
IC1
IC2
IC3
AMP
VF
MIC AMP
SC
JP1
CN3
CN13
CN4
CN2
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN15
MIC IN FRONT
MIC IN
MIC CTL
MIX VOL
R1 MIX/MIC
D1
ES
Q104
R14
R15
ALC ON (CN12-6)
R52
R83
R84
R40 (L) EE LEVEL
R41 (R) EE LEVEL
D9
TNR/SC/AUX (From CN3-6)
C13
C4
1/2 Vcc
EN-CODER
DE-CODER
CCA
AGC/CTL
INPUT SELECTED
HIFI (L)
HIFI (R)
AUX(R)
AUX(L)
TNR(L)
TNR(R)
NORM (L)
NORM (R)
REC
PB
V-1 CONV
DET
WHIGHT
BUFFER
LPF
MUTE
LIMITER
VCO
PC
HOLD
RF
PRE EMP DE EMP
REC/PB/EE
HOLD CTL
DOC DET
L/MIX/R/SAP
NORMAL MIX HIFI
LEFT STEREO RIGHT
LINE
HEAD-PHONE
PHONE CTL
MIX
HP LEVEL
AUDIO
PB HIFI MUTE
HIFI REC/EE/PB NORM CTL
HIFI MODE
NORMAL MODE
SWD 5V
R68
R62
R58
CH SEL (From CN3-1)
HIFI/MIX/NORM
R64
D7
C43
PB 5V From Q4-E
R82
R81
Q1
Q22
AMP
ERASE BIAS OSC T1, Q2
R9 BAIS LEVEL
R69
SWD 12V
R11
D3
Q8
Q9
REC START
AUDIO 11V
TP33 ERASE
TP31
TP32
TP34
Q17
D12
FE ON
REC/PB HEAD
AUDIO ERASE
FULL ERASE
FULL ERASE OSC T2, Q16
R8
C63
Q7
DROP OUT CTL
BIL CTL
C27
R21
C28
L3
Q5
C33
R27
Q6
AUDIO 11V
R15
R72
C3
C25
C1
C8
C14
C47
C16
C10
MUTE (From CN2-7)
R49
R47
HIFI REC START
Q3
MODE CTL
REC/EE/PB/ADUB
TK AMP
EQ
SW1
SW2
SW3
SW4
CH1
CH2
C58
R42
C48
C52
C72
C73
Q12
Q13
PB 5V
DAMP ADJ
R44, C53
R43 C49
AGC AMP
BPF 2
BPF 1
R50
R51
R7
R4
TP53 PB FM
AUDIO FF
PB GAIN CTL R48
D4
SP
From 14 DEMOD, CN2
L (MAIN)
R (SUB)
UNSW 11V
L+
R+
L−
R−
R5 REC LEVEL (L)
R6 REC LEVEL (R)
REC/PB HEAD CH2
REC/PB HEAD CH1
06 TERMINAL
AUDIO (L)
AUDIO (R)
RF AUDIO (To RF CONV)
IND (L)
IND (R)
R73 LEVEL IND (L)
R74 LEVEL IND (R)
To 28 SW/DISPLAY CN10
AUDIO FM
To 03 SERVO
HP OUT (L)
HP OUT (R)
To 36 JACK,CN3
1
2
3
4
5
A
B
C
D
E
F
G
H

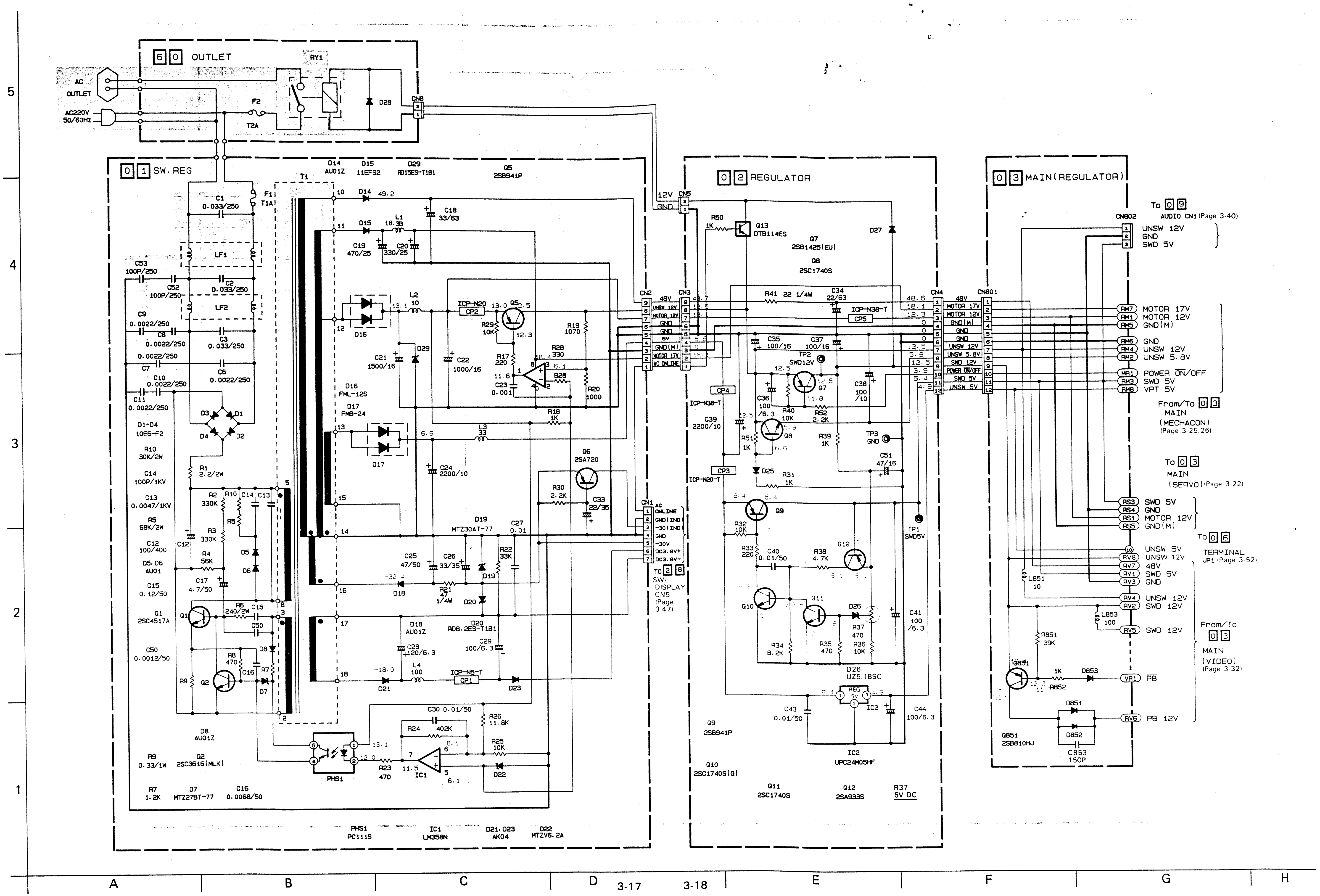
IC 3

HIFI			MIX			NORM			PINS
REC	EE	PB	REC	EE	PB	REC	EE	PB	
L	L	H	L	L	H	L	L	H	31
L	M	H	L	M	H	L	M	H	32

3.8 PRE/REC BLOCK DIAGRAM


43 PRE / REC
IC1
REC START
D2
MUTE SW ON / OFF
REC DET
R23
SWD 5V
R18
R17
MAN / AUTO / SLOW
SYNC
DRUM FF
COLOR ROT
INTEGRATED INJECTION LOGIC (IIL) CTL LOGIC
DRUM FF
To EACH SW
SP / EP D.FF / COMP
ENV DET
(AUTO)
OFF
ENV COMP
ENV DET
GND
C33
C13
AGC DET FILTER
AGC DET
REC/PB
REC
SWD 5V
R16
C12
SP
CH2 Q ADJ
R29
C32
C30, C31
REC DET FILTER
PRE AMP
CH2
REC / PB
ON
EP PB
EP REC
ON
PB ON
PB ON
ON
EP PB
EP REC
ON
REC / PB
CH1
PRE AMP
EP PB
EP REC
ON
SP
CH1 Q ADJ
R28
C27
EP
CH1 Q ADJ
C26
SP PB
SP REC
ON
PRE AMP
CH1
SP PB
SP REC
ON
C21
PB ON
PB ON
SP PB
SP REC
ON
REC / PB
PRE AMP
CH2
C19
EP
CH2 Q ADJ
C18
R26
Vcc
SWD 5V
CN3
ROTAY TRANSFORMER
41 UPPER BOARD
CH2
SP REC / PB HEADS
CH1
SPECIAL HEAD
C3, L2
HPF
Q1
R6, L4, C7
EQ AMP 1
Q2
L5, R10, C9, C10, L6
EQ AMP 2
L7
C11
R12
BUFFER Q3
CN1
PB COLOR
PB FM
REC FM ⊕ REC COLOR
From / To 03 VIDEO, CN204
5
4
3
2
1
A
B
C
D
E
F
G
H

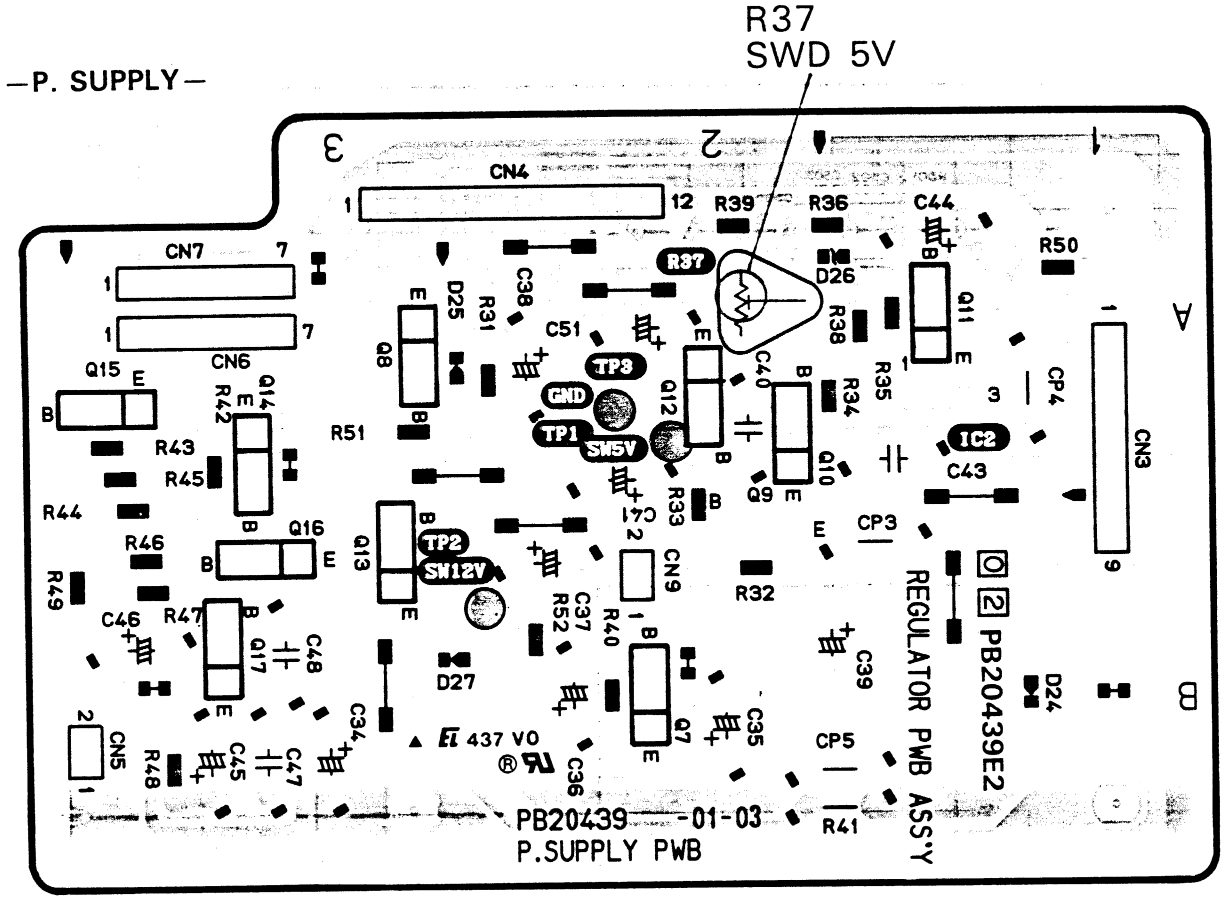
3.9 POWER TRANS, POWER TRANSISTOR & REGULATOR (MAIN) SCHEMATIC DIAGRAMS



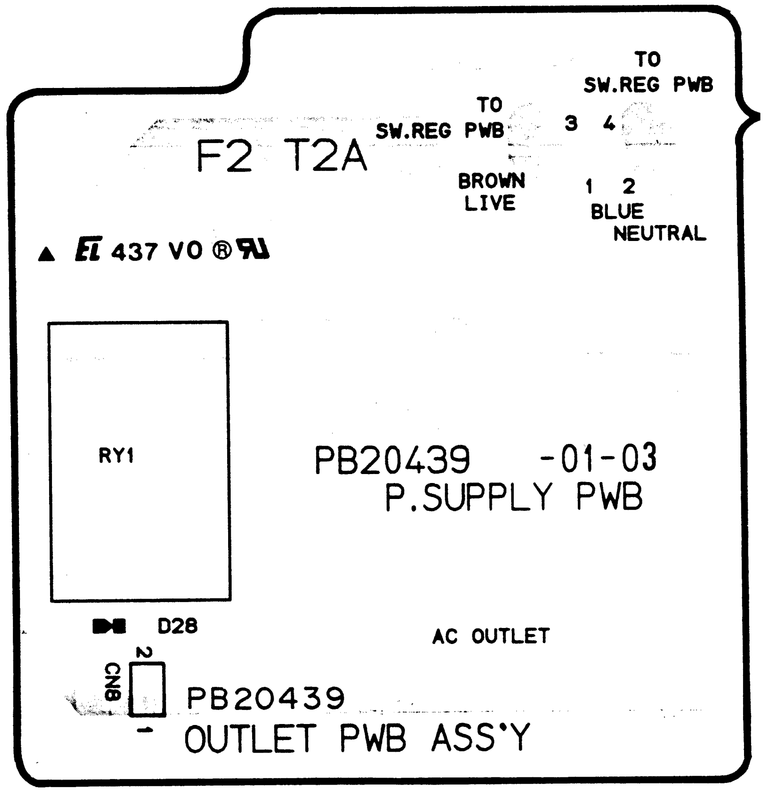
6 0 OUTLET
AC OUTLET
AC220V 50/60Hz
RY1
F2 T2A
D28
CN8
0 1 SW. REG
C1 0.033/250
F1 T1A
LF1
C53 100P/250
C52 100P/250
C2 0.033/250
LF2
C9 0.0022/250
C8 0.0022/250
C3 0.033/250
0.0022/250
C7
C6 0.0022/250
C10 0.0022/250
C11 0.0022/250
D1 D2 D3 D4
D1-D4 10E6-F2
R10 30K/2W
C14 100P/1KV
C13 0.0047/1KV
R5 68K/2W
C12 100/400
D5, D6 AU01
C15 0.12/50
Q1 2SC4517A
C50 0.0012/50
R9 0.33/1W
R7 1.2K
R1 2.2/2W
R2 330K
R3 330K
R4 56K
C17 4.7/50
R6 240/2W
R8 470
C16
D7
D8
Q2
D8 AU01Z
Q2 2SC3616(MLK)
D7 MTZ27BT-77
C16 0.0068/50
T1
D14 AU01Z
D15 11EFS2
D29 RD15ES-T1B1
Q5 2SB941P
D14 49.2
C18 33/63
D15 18.33
L1
C19 470/25
C20 330/25
L2 10
13.1
D16
C21 1500/16
D29
ICP-N20 CP2
13.0 Q5 12.5
R29 10K
12.3
C22 1000/16
R17 220
11.6
C23 0.001
R19 1070
R28 330
6.1
R20 1000
R18 1K
D16 FML-12S
D17 FMB-24
D17
6.6
L3 33
C24 2200/10
Q6 2SA720
R30 2.2K
C33 22/35
D19 MTZ30AT-77
C27 0.01
C25 47/50
C26 33/35
R22 33K
-32.4
D18
R21 47 1/4W
D20
D19
D18 AU01Z
D20 RD8.2ES-T1B1
C28 120/6.3
C29 100/6.3
-18.0
L4 100
ICP-N5-T CP1
D21
D23
C30 0.01/50
R24 402K
R26 11.8K
R25 10K
13.1
12.0
R23 470
11.5
IC1
6.1
D22
PHS1
10 11 12 13 14 15 16 17 18 5 8 3 1 2
PHS1 PC111S
IC1 LM358N
D21, D23 AK04
D22 MTZV6.2A
CN2
48V
UNSW 12V
MOTOR 12V
GND
GND
6V
GND(M)
MOTOR 17V
AC ONLINE
CN1
AC ONLINE
GND(IND)
-30(IND)
GND
-30V
DC3.8V+
DC3.8V-
To 2 8 SW/DISPLAY CN5 (Page 3·47)
12V
GND
CN5
0 2 REGULATOR
CN3
R50 1K
Q13 DTB114ES
Q7 2SB1425(EU)
Q8 2SC1740S
D27
R41 22 1/4W
C34 22/63
ICP-N38-T CP5
48.6
18.1
12.3
0
0
0
12.5
5.9
12.5
3.9
5.4
4.9
C35 100/16
C37 100/16
TP2 SWD12V
12.5
Q7
11.8
C36 100/6.3
R40 10K
R52 2.2K
C38 100/10
CP4
ICP-N38-T
C39 2200/10
12.5
Q8
R51 1K
6.6
R39 1K
TP3 GND
C51 47/16
CP3
ICP-N20-T
D25
R31 1K
Q9
R32 10K
R33 220
C40 0.01/50
R38 4.7K
Q12
TP1 SWD5V
Q10
Q11
D26
R37 470
R34 8.2K
R35 470
R36 10K
C41 100/6.3
D26 UZ5.1BSC
REG 5V
IC2
C43 0.01/50
C44 100/6.3
IC2 UPC24M05HF
Q9 2SB941P
Q10 2SC1740S(Q)
Q11 2SC1740S
Q12 2SA933S
R37 5V DC
CN4
48V
MOTOR 17V
MOTOR 12V
GND(M)
GND
GND
UNSW 12V
UNSW 5.8V
SWD 12V
POWER ON/OFF
SWD 5V
UNSW 5V
CN801
0 3 MAIN(REGULATOR)
CN802
To 0 9 AUDIO CN1 (Page 3·40)
UNSW 12V
GND
SWD 5V
RM7 MOTOR 17V
RM1 MOTOR 12V
RM5 GND(M)
RM6 GND
RM4 UNSW 12V
RM2 UNSW 5.8V
MR1 POWER ON/OFF
RM3 SWD 5V
RM8 VPT 5V
From/To 0 3 MAIN (MECHACON) (Page 3·25,26)
To 0 3 MAIN (SERVO) (Page 3·22)
RS3 SWD 5V
RS4 GND
RS1 MOTOR 12V
RS5 GND(M)
To 0 6 TERMINAL JP1 (Page 3·52)
10 UNSW 5V
RV8 UNSW 12V
RV7 48V
RV1 SWD 5V
RV3 GND
RV4 UNSW 12V
RV2 SWD 12V
L851 10
L853 100
RV5 SWD 12V
From/To 0 3 MAIN (VIDEO) (Page 3·32)
R851 39K
Q851
1K
D853
R852
VR1 PB
D851
D852
RV6 PB 12V
C853 150P
Q851 2SB810HJ
5 4 3 2 1
A B C D E F G H

3.10 SWITCHING REGULATOR CIRCUIT BOARDS

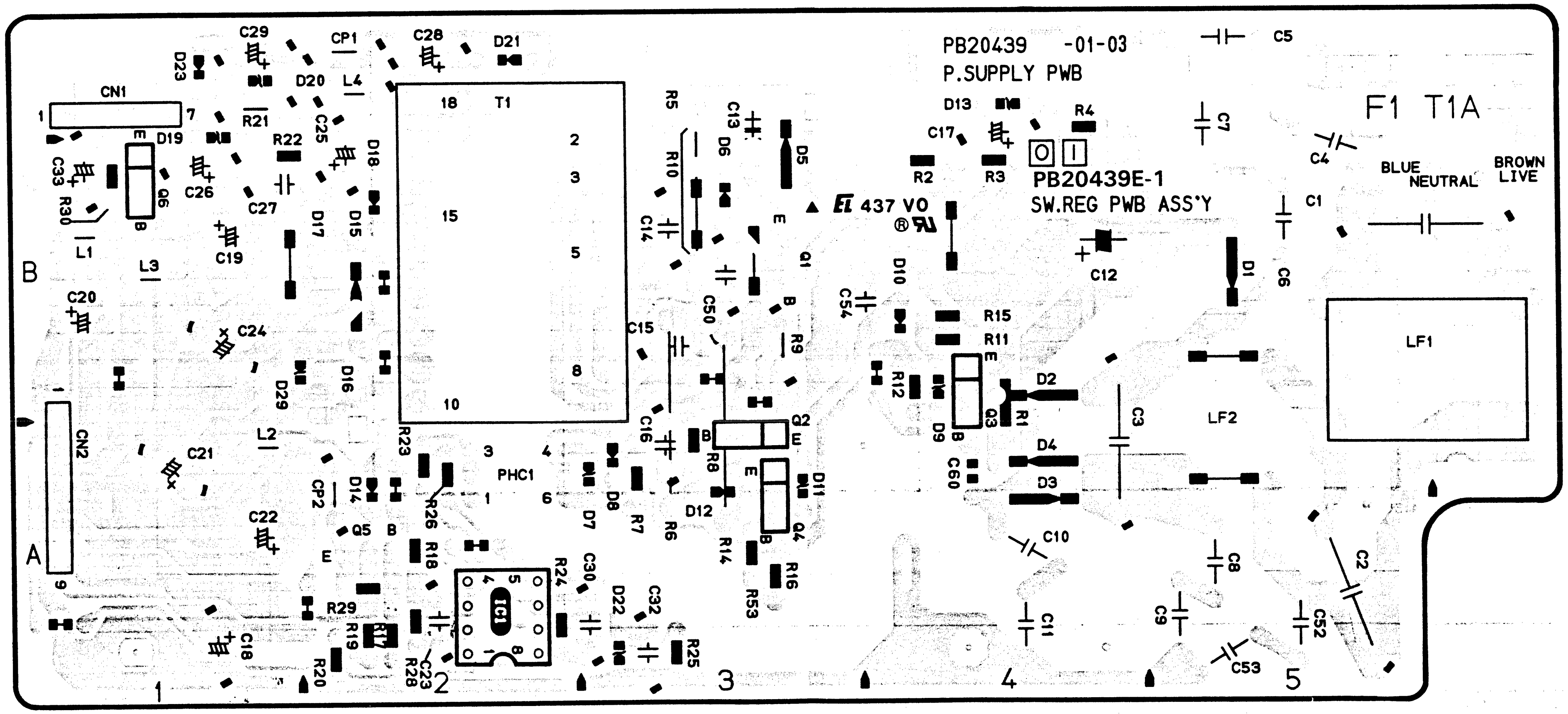
—P. SUPPLY—


R37
SWD 5V
CN4
CN7
CN6
CN3
CN9
CN5
IC2
TP1
TP2
TP3
GND
SW5V
SW12V
▲ Ɛ 437 VO ®ᴿᵁ
PB20439 -01-03
P.SUPPLY PWB
REGULATOR PWB ASS'Y
PB20439E2

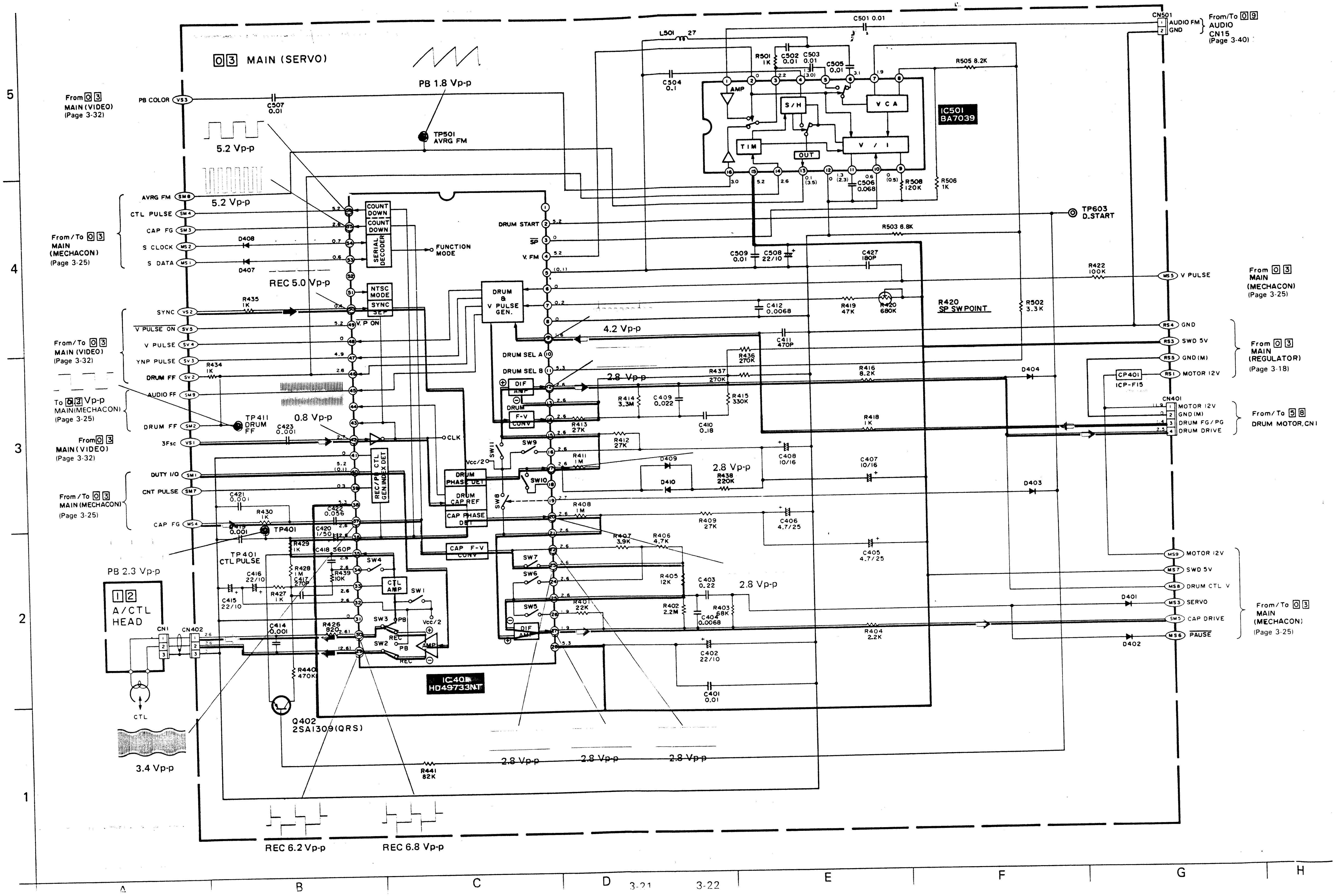
—OUTLET—


TO
SW.REG PWB
3 4
TO
SW.REG PWB
F2 T2A
BROWN
LIVE
1 2
BLUE
NEUTRAL
▲ Ɛ 437 VO ®ᴿᵁ
RY1
PB20439 -01-03
P.SUPPLY PWB
D28
AC OUTLET
CN8
PB20439
OUTLET PWB ASS'Y

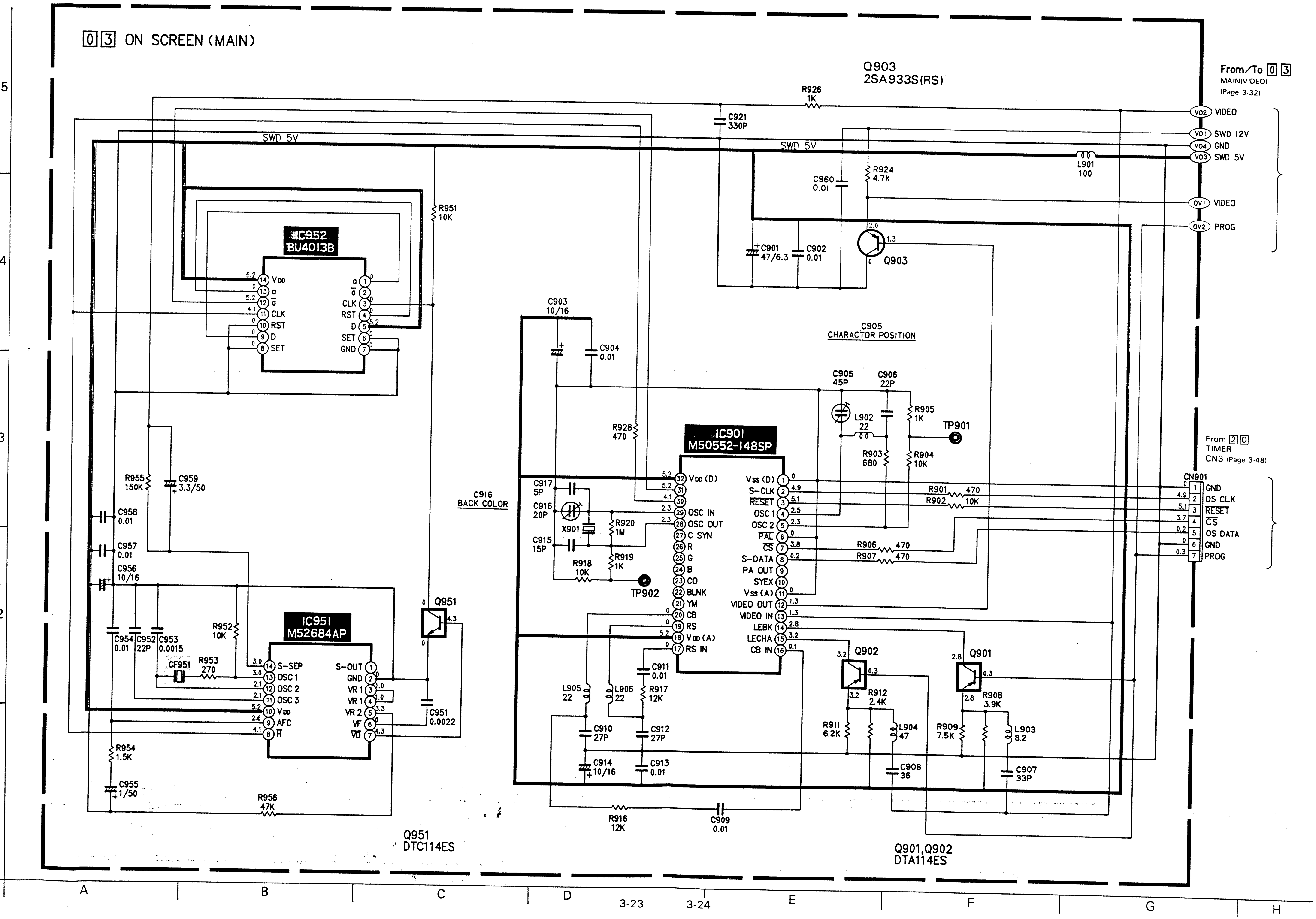
—SW. REG—


PB20439 -01-03
P.SUPPLY PWB
F1 T1A
BLUE
NEUTRAL
BROWN
LIVE
PB20439E-1
SW.REG PWB ASS'Y
▲ Ɛ 437 VO ®ᴿᵁ
CN1
CN2
T1
PHC1
IC1
LF1
LF2

3.11 SERVO SCHEMATIC DIAGRAM

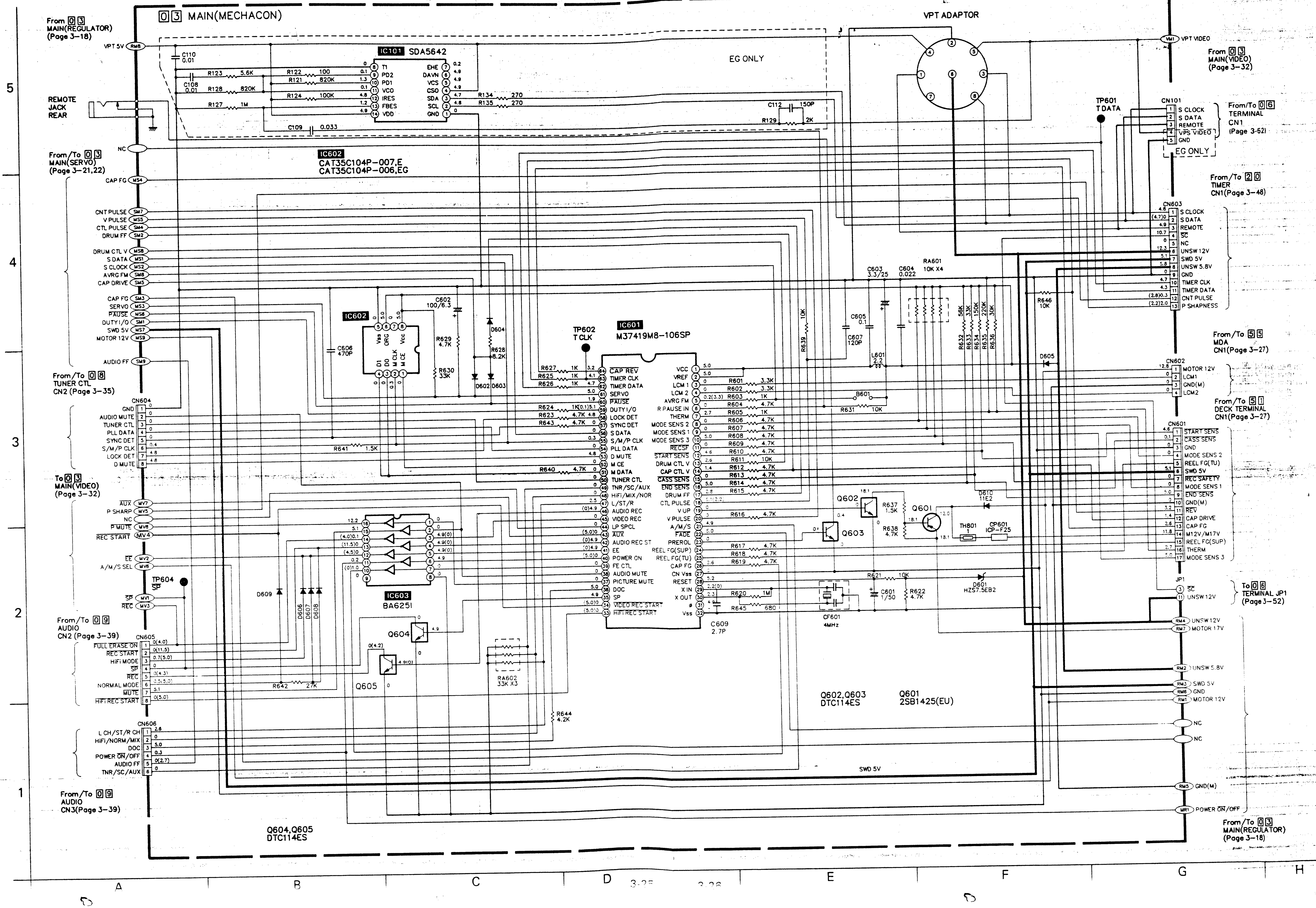

03 MAIN (SERVO)
From 03 MAIN (VIDEO) (Page 3-32)
PB COLOR VS3
C507 0.01
PB 1.8 Vp-p
TP501 AVRG FM
5.2 Vp-p
5.2 Vp-p
L501 27
R501 1K
C502 0.01
C503 0.01
C504 0.1
C505 0.01
C501 0.01
R505 8.2K
AMP
S/H
VCA
TIM
OUT
V/I
IC501 BA7039
C506 0.068
R508 120K
R506 1K
CN501
AUDIO FM
GND
From/To 09 AUDIO CN15 (Page 3-40)
From/To 03 MAIN (MECHACON) (Page 3-25)
AVRG FM SM8
CTL PULSE SM4
CAP FG SM3
S CLOCK MS2
S DATA MS1
D408
D407
COUNT DOWN
COUNT DOWN
SERIAL DECODER
FUNCTION MODE
REC 5.0 Vp-p
NTSC MODE
SYNC SEP
V. P ON
DRUM START
SP
V. FM
DRUM & V PULSE GEN.
TP603 D.START
R503 6.8K
C509 0.01
C508 22/10
C427 180P
R422 100K
V PULSE MS5
From 03 MAIN (MECHACON) (Page 3-25)
From/To 03 MAIN (VIDEO) (Page 3-32)
SYNC VS2
V PULSE ON SV5
V PULSE SV4
YNP PULSE SV3
DRUM FF SV2
R435 1K
R434 1K
C412 0.0068
R419 47K
R420 680K
R420 SP SW POINT
R502 3.3K
4.2 Vp-p
C411 470P
GND RS4
SWD 5V RS3
GND (M) RS5
MOTOR 12V RS1
From 03 MAIN (REGULATOR) (Page 3-18)
CP401 ICP-F15
DRUM SEL A
DRUM SEL B
R436 270K
R437 270K
2.8 Vp-p
R416 8.2K
D404
DIF AMP
DRUM F-V CONV
R414 3.3M
C409 0.022
R415 330K
R413 27K
C410 0.18
R418 1K
CN401
MOTOR 12V
GND (M)
DRUM FG/PG
DRUM DRIVE
From/To 58 DRUM MOTOR, CN1
To 03 MAIN (MECHACON) (Page 3-25)
AUDIO FF SM9
DRUM FF SM2
TP411 DRUM FF
0.8 Vp-p
C423 0.001
CLK
From 03 MAIN (VIDEO) (Page 3-32)
3Fsc VS1
R412 27K
SW9
SW11
Vcc/2
R411 1M
C408 10/16
C407 10/16
D409
D410
2.8 Vp-p
R438 220K
REC/PB CTL GEN. INDEX DET
DRUM PHASE DET
SW10
DRUM CAP REF
SW8
D403
From/To 03 MAIN (MECHACON) (Page 3-25)
DUTY I/O SM1
CNT PULSE SM7
CAP FG MS4
C421 0.001
C422 0.056
R430 1K
C419 0.001
TP401
TP401 CTL PULSE
C420 1/50
R408 1M
R409 27K
C406 4.7/25
CAP PHASE DET
CAP F-V CONV
R407 3.9K
R406 4.7K
C405 4.7/25
MOTOR 12V MS9
SWD 5V MS7
DRUM CTL V MS8
SERVO MS3
CAP DRIVE MS5
PAUSE MS6
From/To 03 MAIN (MECHACON) (Page 3-25)
PB 2.3 Vp-p
12 A/CTL HEAD
CN1
CN402
CTL
R429 1K
C418 560P
C416 22/10
R428 1M
C417 270P
R439 10K
C415 22/10
R427 1K
SW4
CTL AMP
SW1
SW7
SW6
R405 12K
C403 0.22
2.8 Vp-p
R402 2.2M
R401 22K
R403 68K
C404 0.0068
D401
D402
SW5
C414 0.001
R426 820
SW3
SW2
PB
REC
AMP
Vcc/2
R404 2.2K
C402 22/10
C401 0.01
R440 470K
IC401 HD49733NT
Q402 2SA1309(QRS)
R441 82K
2.8 Vp-p
2.8 Vp-p
2.8 Vp-p
3.4 Vp-p
REC 6.2 Vp-p
REC 6.8 Vp-p
1
2
3
4
5
A
B
C
D
E
F
G
H

3.12 ON SCREEN SCHEMATIC DIAGRAM

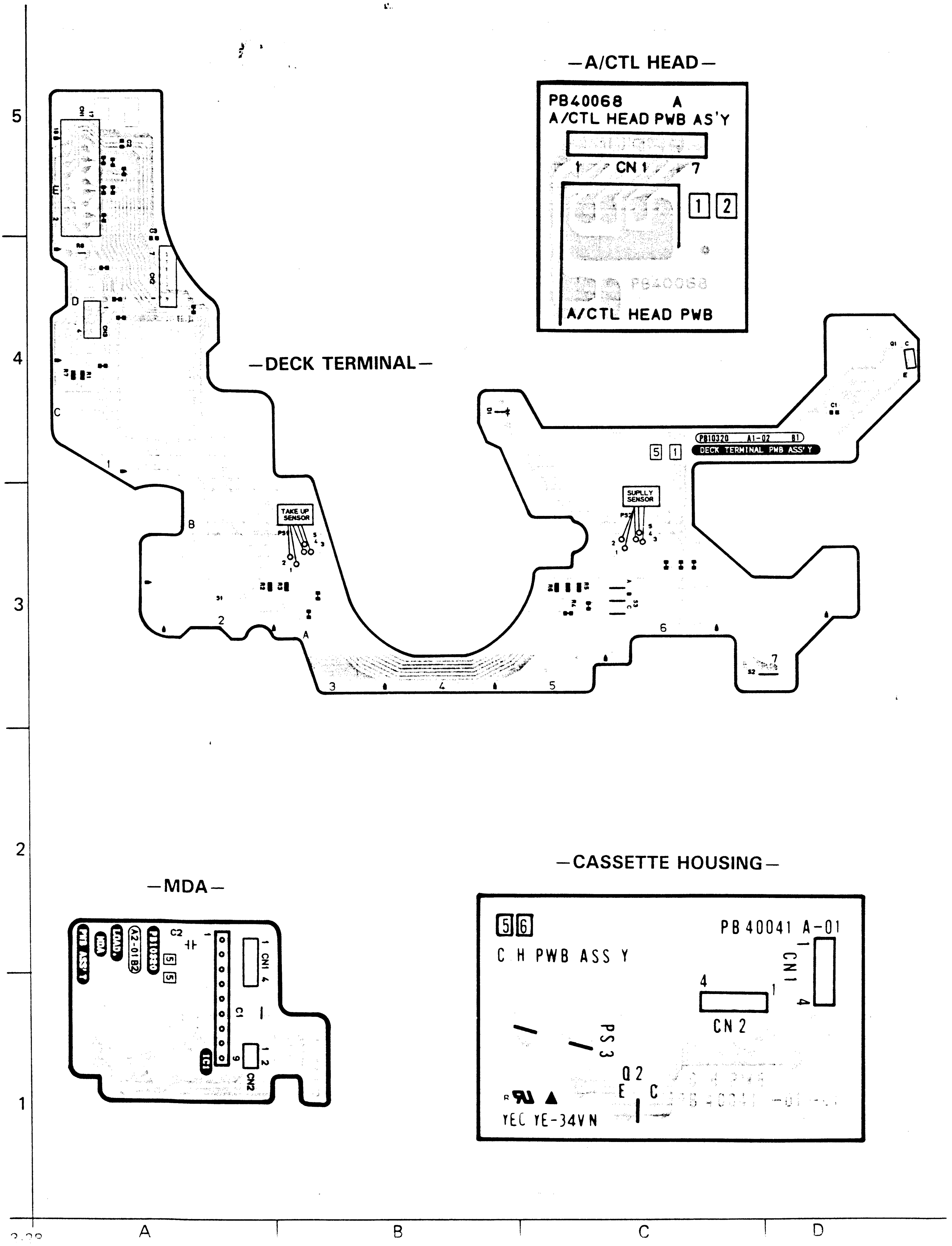


03 ON SCREEN (MAIN)
Q903
2SA933S(RS)
From/To 03
MAIN(VIDEO)
(Page 3-32)
VO2 VIDEO
VO1 SWD 12V
VO4 GND
VO3 SWD 5V
OV1 VIDEO
OV2 PROG
SWD 5V
R926
1K
C921
330P
L901
100
C960
0.01
R924
4.7K
C901
47/6.3
C902
0.01
IC952
BU4013B
VDD
Q
Q̄
CLK
RST
D
SET
GND
R951
10K
C903
10/16
C904
0.01
C905
CHARACTOR POSITION
C905
45P
C906
22P
L902
22
R905
1K
TP901
R903
680
R904
10K
IC901
M50552-148SP
VDD (D)
OSC IN
OSC OUT
C SYN
R
G
B
CO
BLNK
YM
CB
RS
VDD (A)
RS IN
VSS (D)
S-CLK
RESET
OSC 1
OSC 2
PAL
CS
S-DATA
PA OUT
SYEX
VSS (A)
VIDEO OUT
VIDEO IN
LEBK
LECHA
CB IN
From 20
TIMER
CN3 (Page 3-48)
CN901
GND
OS CLK
RESET
CS
OS DATA
GND
PROG
R901 470
R902 10K
R906 470
R907 470
R928
470
C917
5P
C916
20P
X901
R920
1M
C915
15P
R918
10K
R919
1K
TP902
C916
BACK COLOR
R955
150K
C959
3.3/50
C958
0.01
C957
0.01
C956
10/16
IC951
M52684AP
S-SEP
OSC 1
OSC 2
OSC 3
VDD
AFC
H̄
S-OUT
GND
VR 1
VR 1
VR 2
VF
V̄D
R952
10K
C954
0.01
C952
22P
C953
0.0015
CF951
R953
270
Q951
C951
0.0022
R954
1.5K
C955
1/50
R956
47K
Q951
DTC114ES
C911
0.01
R917
12K
L905
22
L906
22
C910
27P
C912
27P
C914
10/16
C913
0.01
R916
12K
C909
0.01
Q902
R912
2.4K
R911
6.2K
L904
47
C908
36
Q901
R908
3.9K
R909
7.5K
L903
8.2
C907
33P
Q901,Q902
DTA114ES
A
B
C
D
E
F
G
H
5
4
3
2

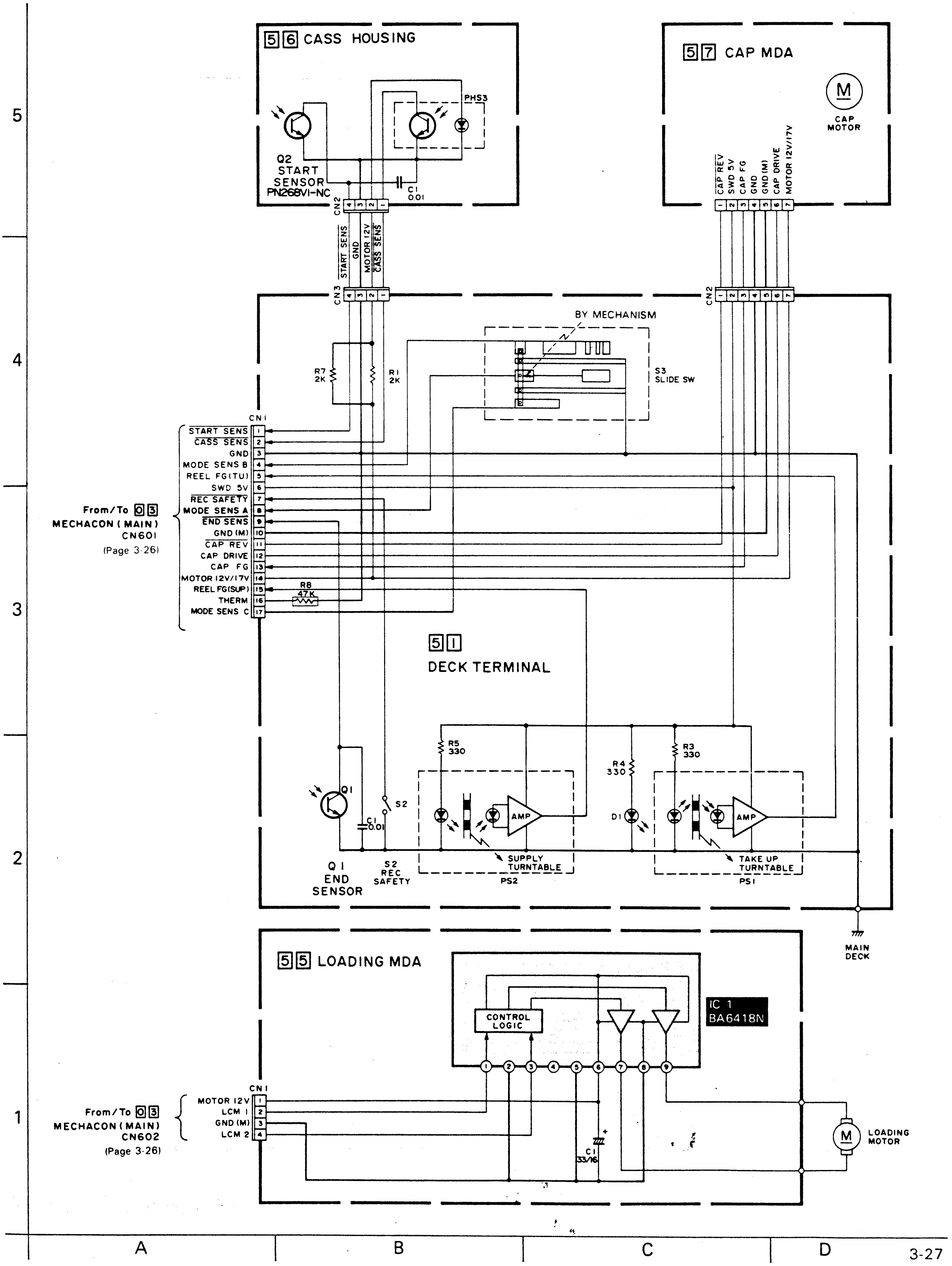
3.13 SYSTEM CTL SCHEMATIC DIAGRAM


03 MAIN(MECHACON)
VPT ADAPTOR
EG ONLY
IC101 SDA5642
IC602 CAT35C104P-007,E
CAT35C104P-006,EG
IC602
IC601 M37419M8-106SP
IC603 BA6251
TP601 TDATA
TP602 TCLK
TP604 SP
Q601 2SB1425(EU)
Q602,Q603 DTC114ES
Q604,Q605 DTC114ES
From 03 MAIN(REGULATOR) (Page 3-18)
REMOTE JACK REAR
From/To 03 MAIN(SERVO) (Page 3-21,22)
From/To 08 TUNER CTL CN2 (Page 3-35)
To 03 MAIN(VIDEO) (Page 3-32)
From/To 09 AUDIO CN2 (Page 3-39)
From/To 09 AUDIO CN3(Page 3-39)
From 03 MAIN(VIDEO) (Page 3-32)
From/To 06 TERMINAL CN1 (Page 3-52)
From/To 20 TIMER CN1(Page 3-48)
From/To 55 MDA CN1(Page 3-27)
From/To 51 DECK TERMINAL CN1(Page 3-27)
To 06 TERMINAL JP1 (Page 3-52)
From/To 03 MAIN(REGULATOR) (Page 3-18)
CN101
CN603
CN602
CN601
CN604
CN605
CN606
JP1
RA601 10K X4
RA602 33K X3
CF601 4MHz
TH801
CP601 ICP-F25
D601 HZS7.5EB2
D610 11E2
SWD 5V
1
2
3
4
5
A
B
C
D
E
F
G
H

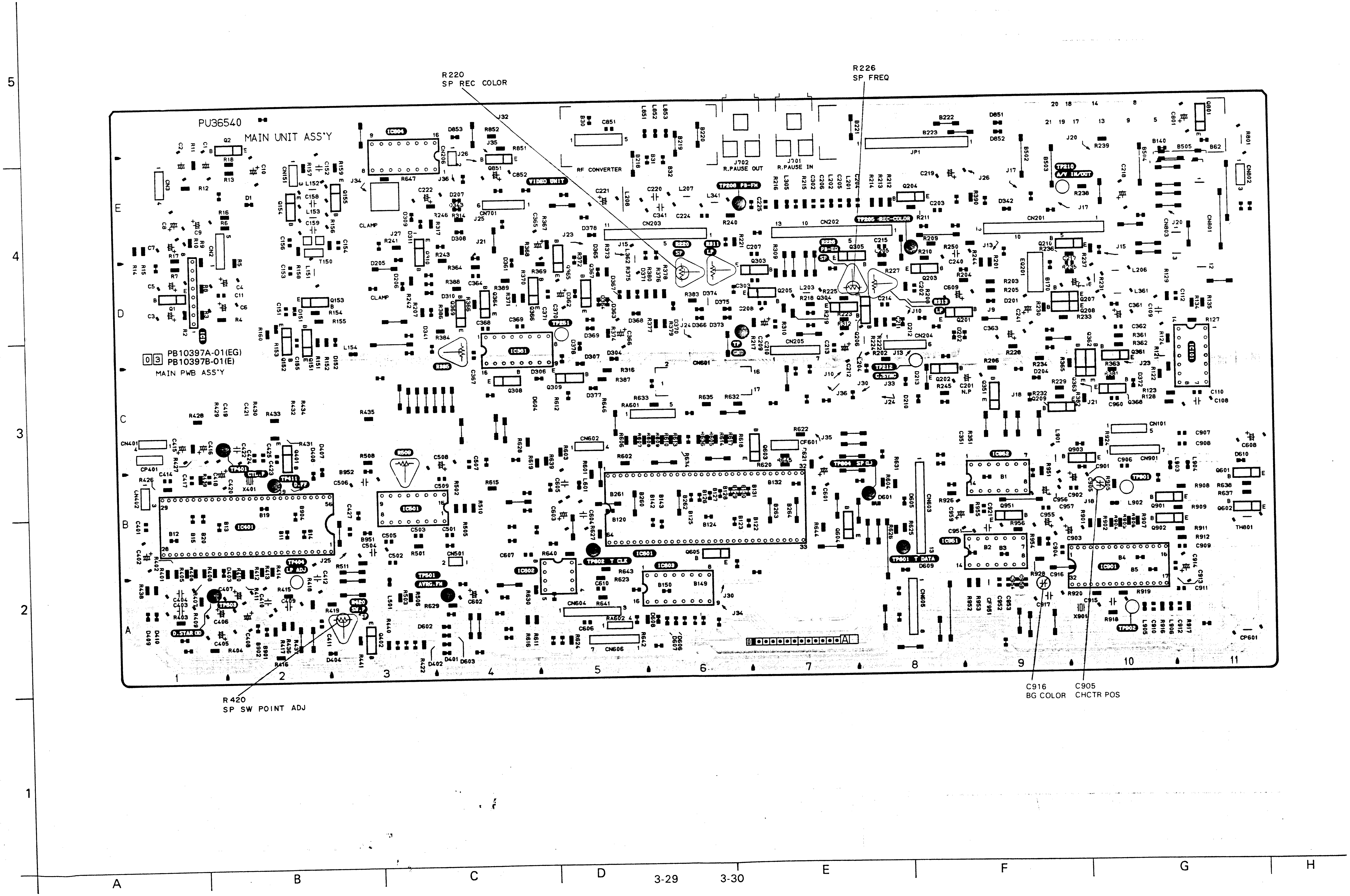
3.15 DECK TERMINAL, MODE MOTOR, C. HOUSING & A/CTL HEAD CIRCUIT BOARDS


—A/CTL HEAD—
PB40068 A
A/CTL HEAD PWB AS'Y
1 CN1 7
1 2
PB40068
A/CTL HEAD PWB
—DECK TERMINAL—
PB10320 A1-02 B1
DECK TERMINAL PWB ASS'Y
5 1
TAKE UP SENSOR
PS1
SUPLLY SENSOR
PS2
Q1
C
E
C1
D1
CN1
CN2
CN3
A
B
C
D
E
1
2
3
4
5
6
7
S1
S2
—MDA—
PWB ASS'Y
MDA
LOAD.
A2-01B2
PB10320
5 5
C2
C1
CN1
CN2
IC1
1
4
9
2
—CASSETTE HOUSING—
5 6
PB 40041 A-01
C H PWB ASS Y
CN1
CN 2
PS 3
Q 2
E
C
YEC YE-34VN
1
2
3
4
5
A
B
C
D

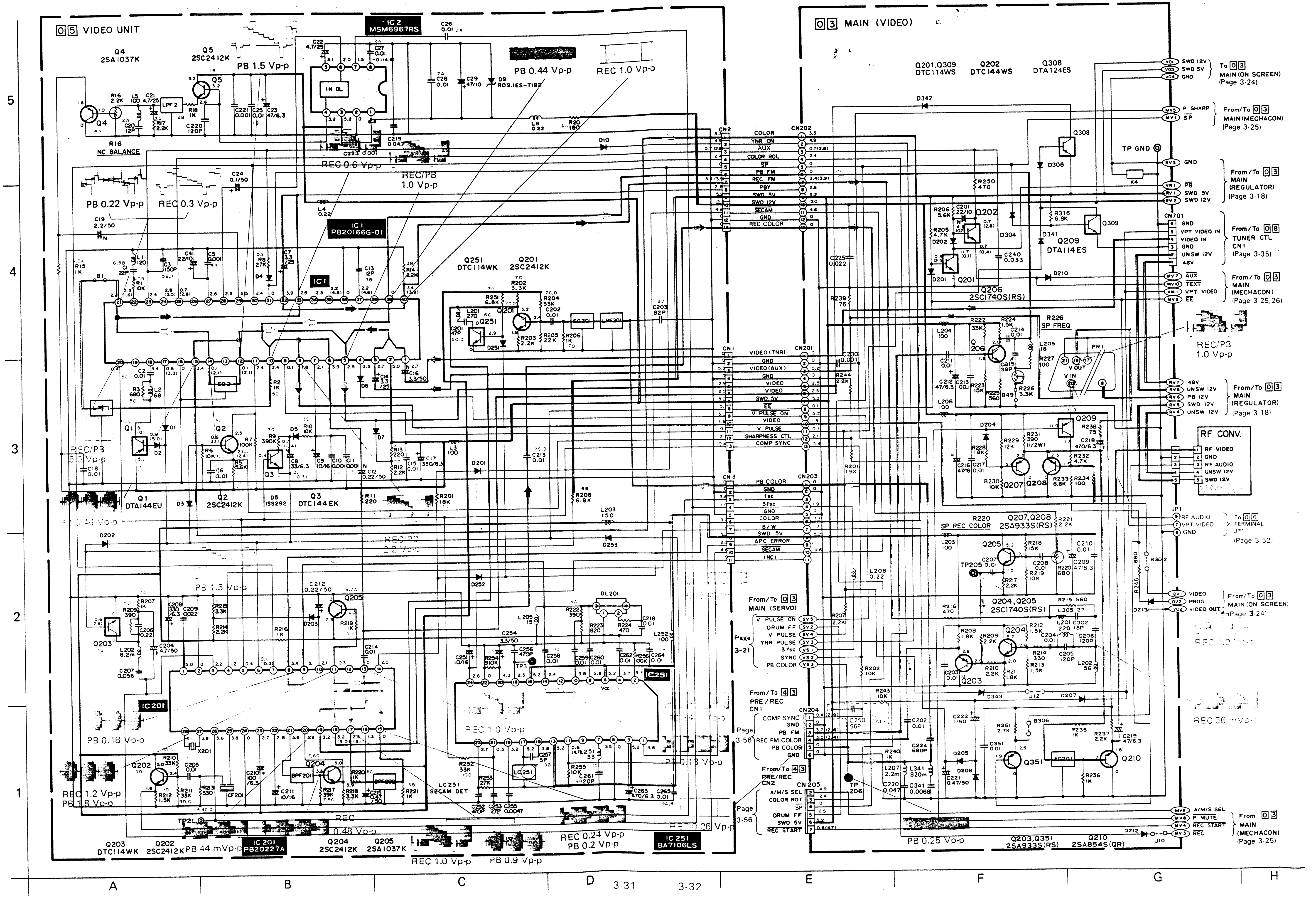
3.14 DECK TERMINAL, MODE MOTOR, CAPSTAN MDA & C. HOUSING SCHEMATIC DIAGRAMS

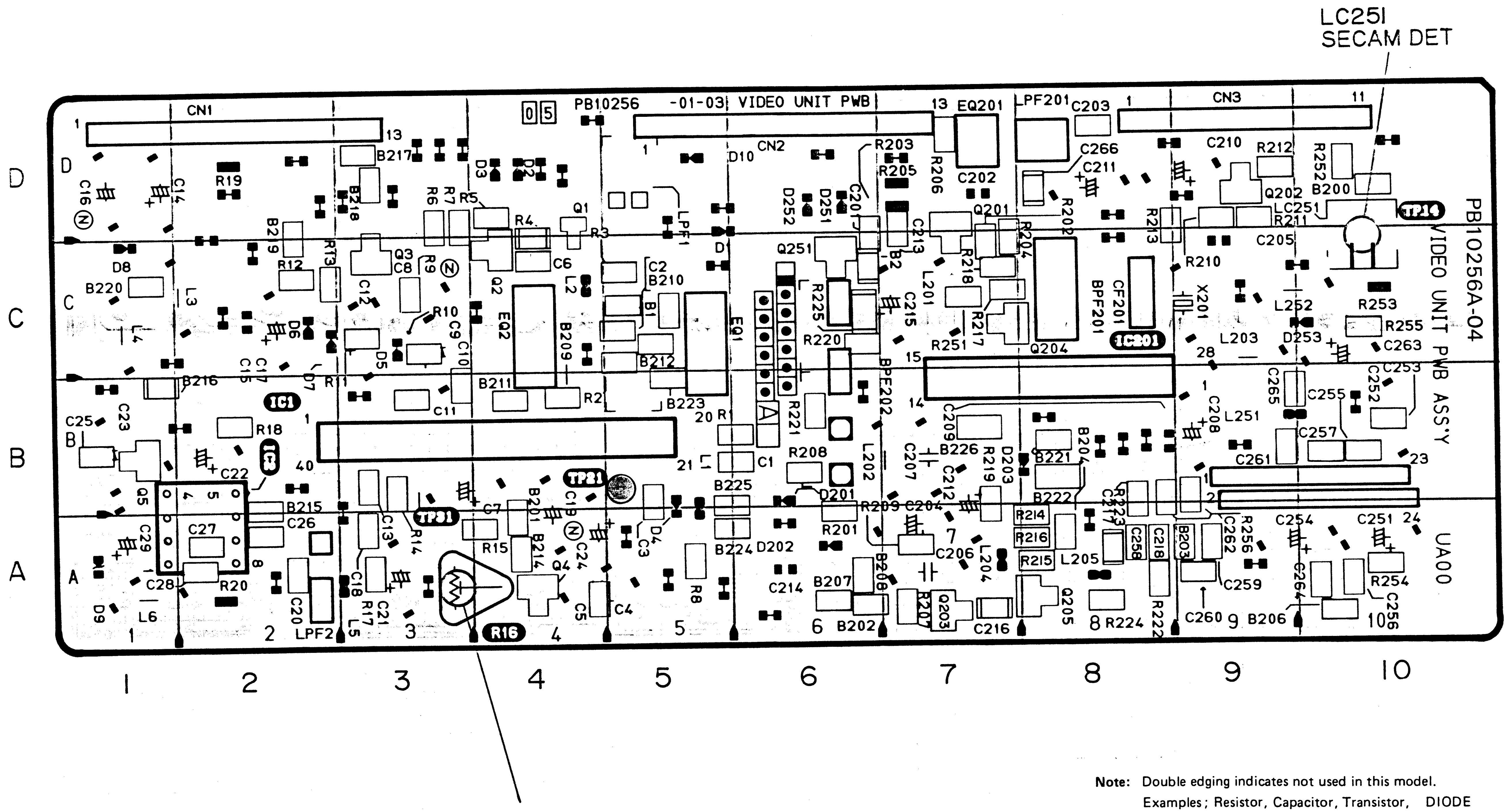

5 6 CASS HOUSING
PHS3
Q2
START
SENSOR
PN268VI-NC
C1
0.01
CN2
START SENS
GND
MOTOR 12V
CASS SENS
CN3
5 7 CAP MDA
M
CAP
MOTOR
CAP REV
SWD 5V
CAP FG
GND
GND (M)
CAP DRIVE
MOTOR 12V/17V
CN2
BY MECHANISM
S3
SLIDE SW
R7
2K
R1
2K
CN1
START SENS
CASS SENS
GND
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND (M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V/17V
REEL FG(SUP)
THERM
MODE SENS C
R8
47K
From/To 0 3
MECHACON (MAIN)
CN601
(Page 3-26)
5 1
DECK TERMINAL
R5
330
R4
330
R3
330
Q1
S2
C1
0.01
AMP
D1
AMP
SUPPLY
TURNTABLE
TAKE UP
TURNTABLE
Q 1
END
SENSOR
S2
REC
SAFETY
PS2
PS1
MAIN
DECK
5 5 LOADING MDA
CONTROL
LOGIC
IC 1
BA6418N
1
2
3
4
5
6
7
8
9
CN1
MOTOR 12V
LCM 1
GND (M)
LCM 2
From/To 0 3
MECHACON (MAIN)
CN602
(Page 3-26)
C1
33/16
M
LOADING
MOTOR
5
4
3
2
1
A
B
C
D

3.16 MAIN CIRCUIT BOARD


R220
SP REC COLOR
R226
SP FREQ
PU36540
MAIN UNIT ASS'Y
PB10397A-01(EG)
PB10397B-01(E)
MAIN PWB ASS'Y
RF CONVERTER
J702
R.PAUSE OUT
J701
R.PAUSE IN
VIDEO UNIT
CLAMP
TP206 PB-FM
TP205 REC-COLOR
TP210 A/V IN/OUT
TP212
TP604 SP DJ
TP601 T DATA
TP602 T CLK
TP501 AVRG.FM
TP404 LP ADJ
D.STAR OD
IC401
IC501
IC601
IC602
IC603
IC604
IC301
IC901
IC951
IC952
IC101
JP1
CN201
CN202
CN203
CN204
CN205
CN601
CN602
CN603
CN604
CN605
CN606
CN901
CN101
R420
SP SW POINT ADJ
C916
BG COLOR
C905
CHCTR POS
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11

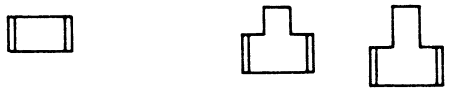
3.17 VIDEO UNIT & VIDEO (MAIN) SCHEMATIC DIAGRAMS


05 VIDEO UNIT
03 MAIN (VIDEO)
Q4 2SA1037K
Q5 2SC2412K
IC2 MSM6967RS
IC1 PB20166G-01
IC201 PB20227A
IC251 BA7106LS
Q1 DTA144EU
Q2 2SC2412K
D5 1SS292
Q3 DTC144EK
Q251 DTC114WK
Q201 2SC2412K
Q203 DTC114WK
Q202 2SC2412K
Q204 2SC2412K
Q205 2SA1037K
R16 NC BALANCE
LC251 SECAM DET
DL201
PB 1.5 Vp-p
PB 0.44 Vp-p
REC 1.0 Vp-p
REC 0.6 Vp-p
REC/PB 1.0 Vp-p
PB 0.22 Vp-p
REC 0.3 Vp-p
REC/PB 5.0 Vp-p
REC/PB 2.2 Vp-p
PB 0.18 Vp-p
REC 1.2 Vp-p
PB 1.8 Vp-p
REC 0.48 Vp-p
PB 44 mVp-p
REC 1.0 Vp-p
PB 0.9 Vp-p
REC 0.24 Vp-p
PB 0.2 Vp-p
PB 0.13 Vp-p
PB 0.26 Vp-p
CN2
CN202
COLOR
YNR ON
AUX
COLOR ROL
SP
PB FM
REC FM
PBY
SWD 5V
SWD 12V
SECAM
GND
REC COLOR
CN1
CN201
VIDEO (TNR)
GND
VIDEO (AUX)
GND
VIDEO
VIDEO
SWD 5V
EE
V PULSE ON
VIDEO
V PULSE
SHARPNESS CTL
COMP SYNC
CN3
CN203
PB COLOR
GND
fsc
3fsc
GND
COLOR
B/W
SWD 5V
APC ERROR
SECAM
(NC)
Q201,Q309 DTC114WS
Q202 DTC144WS
Q308 DTA124ES
Q209 DTA114ES
Q206 2SC1740S(RS)
Q207,Q208 2SA933S(RS)
Q204,Q205 2SC1740S(RS)
Q203,Q351 2SA933S(RS)
Q210 2SA854S(QR)
SWD 12V
SWD 5V
GND
To 03 MAIN (ON SCREEN) (Page 3-24)
P. SHARP
SP
From/To 03 MAIN (MECHACON) (Page 3-25)
TP GND
GND
PB
SWD 5V
SWD 12V
From/To 03 MAIN (REGULATOR) (Page 3-18)
CN701
GND
VPT VIDEO IN
VIDEO IN
GND
UNSW 12V
48V
From/To 08 TUNER CTL CN1 (Page 3-35)
AUX
TEXT
VPT VIDEO
EE
From/To 03 MAIN (MECHACON) (Page 3-25,26)
R226 SP FREQ
PR1
V OUT
V IN
REC/PB 1.0 Vp-p
48V
UNSW 12V
PB 12V
SWD 12V
UNSW 12V
From/To 03 MAIN (REGULATOR) (Page 3-18)
RF CONV.
RF VIDEO
GND
RF AUDIO
UNSW 12V
SWD 12V
JP1
RF AUDIO
VPT VIDEO
GND
To 06 TERMINAL JP1 (Page 3-52)
R220 SP REC COLOR
TP205
VIDEO
PROG
VIDEO OUT
From/To 03 MAIN (ON SCREEN) (Page 3-24)
From/To 03 MAIN (SERVO)
V PULSE ON
DRUM FF
V PULSE
YNR PULSE
3 fsc
SYNC
PB COLOR
Page 3-21
From/To 43 PRE/REC CN1
CN204
COMP SYNC
GND
PB FM
REC FM COLOR
PB COLOR
GND
Page 3-56
From/To 43 PRE/REC CN2
CN205
A/M/S SEL
COLOR ROT
SP
DRUM FF
SWD 5V
REC START
TP206
REC 56 mVp-p
PB 0.25 Vp-p
A/M/S SEL
P. MUTE
REC START
REC
From 03 MAIN (MECHACON) (Page 3-25)
A
B
C
D
E
F
G
H
1
2
3
4
5

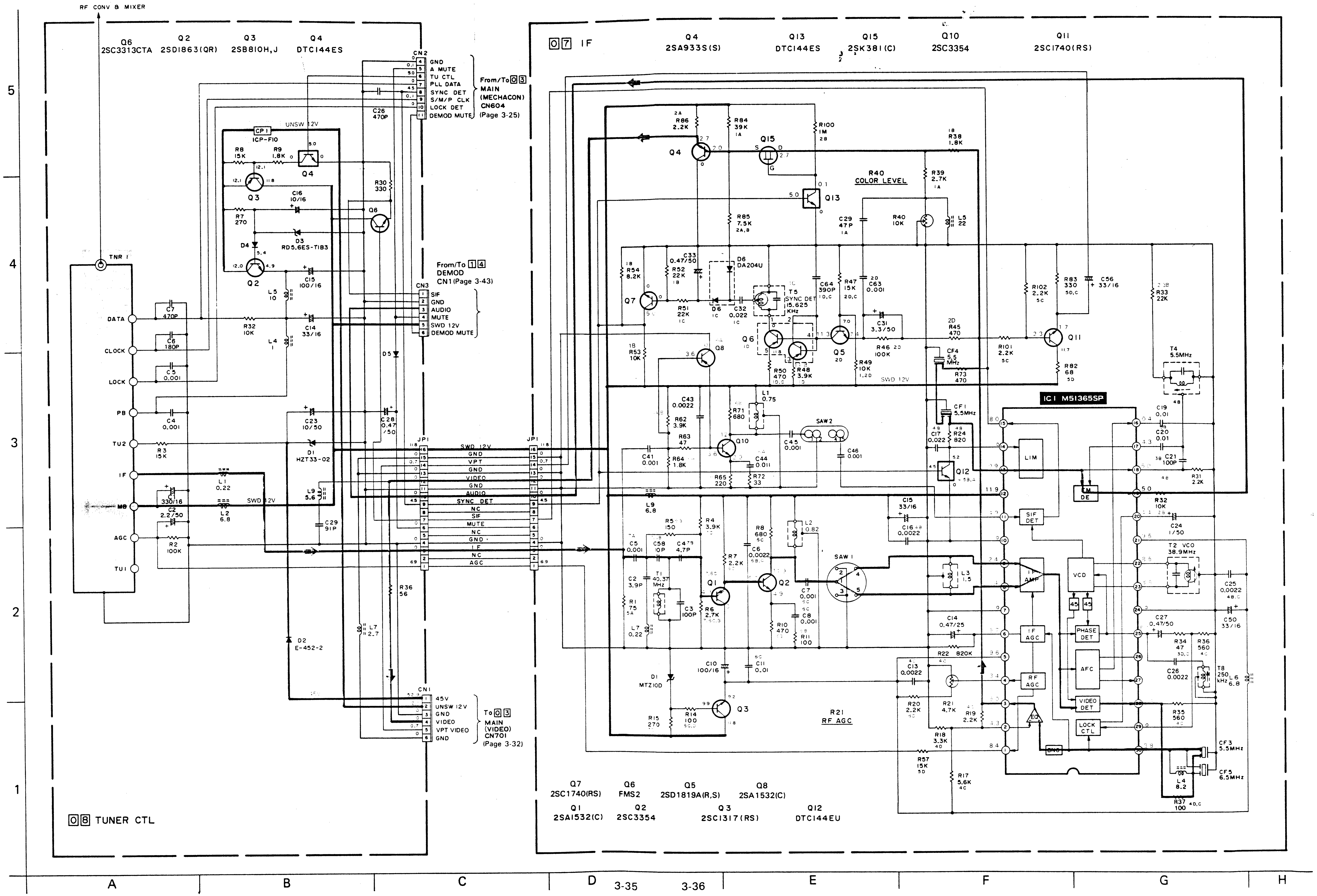

LC251
SECAM DET
PB10256 -01-03 VIDEO UNIT PWB
PB10256A-04
VIDEO UNIT PWB ASS'Y
UA00
CN1
CN2
CN3
EQ201
LPF201
C203
C202
Q201
Q202
Q204
Q251
Q205
Q203
IC201
IC1
TP21
TP31
TP11
EQ1
EQ2
BPF201
BPF202
CF201
X201
L201
L202
L203
L204
L205
L251
L252
LPF1
LPF2
R16
R201
R202
R203
R205
R206
R208
R209
R210
R211
R212
R213
R214
R215
R216
R217
R218
R219
R220
R221
R222
R223
R224
R225
R251
R252
R253
R254
R255
R256
C205
C206
C207
C208
C209
C210
C211
C212
C213
C214
C215
C216
C217
C218
C251
C252
C253
C254
C255
C256
C257
C258
C259
C260
C261
C262
C263
C264
C265
C266
D201
D202
D203
D251
D252
D253
B200
B201
B202
B203
B204
B206
B207
B208
B209
B210
B211
B212
B214
B215
B216
B217
B218
B219
B220
B221
B222
B223
B224
B225
B226
Q1
Q2
Q3
Q4
Q5
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R14
R15
R17
R18
R19
R20
RT3
L1
L2
L3
L4
L5
L6
B1
B2
A
B
C
D
1
2
3
4
5
6
7
8
9
10
05
R16
NC BAL

Note: Double edging indicates not used in this model.

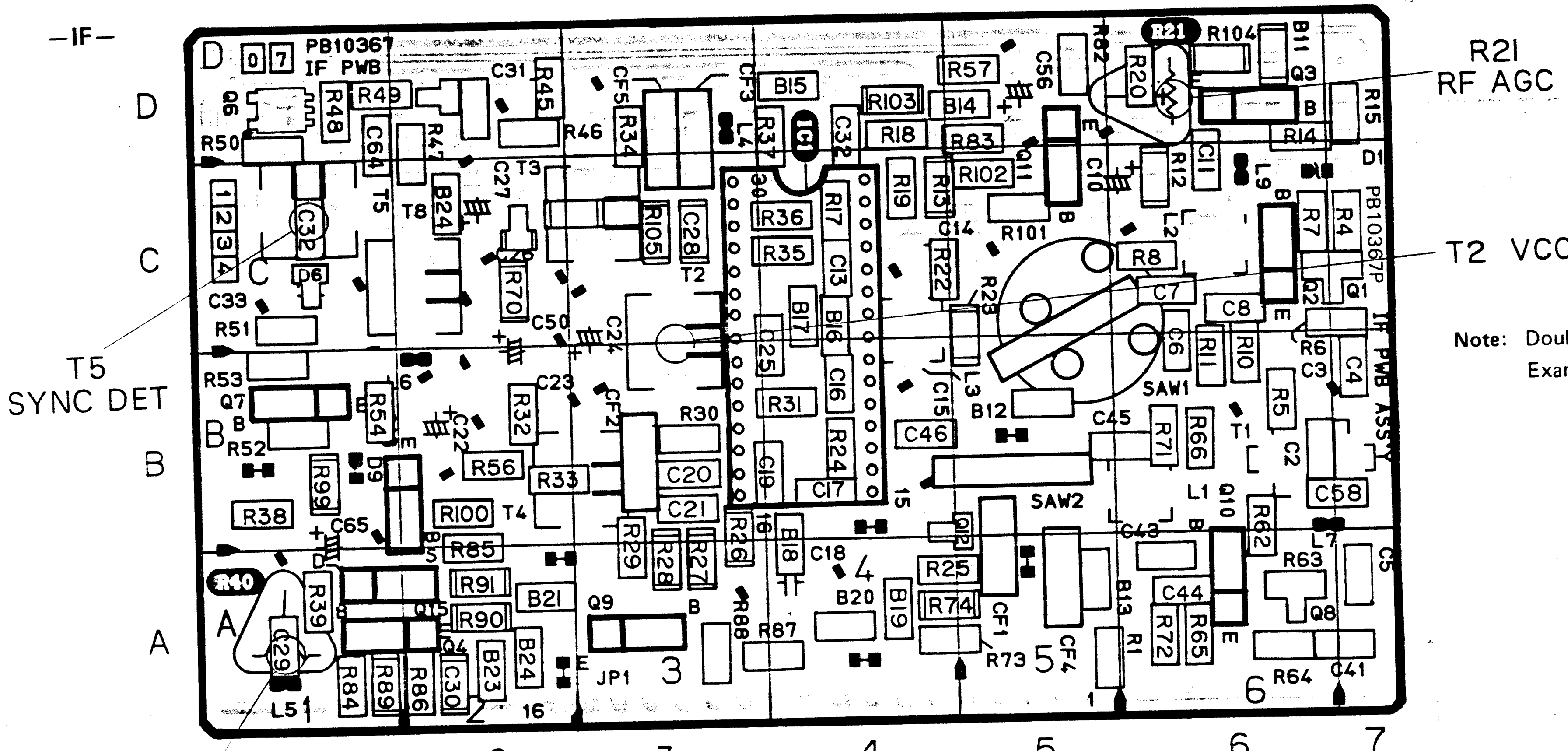
Examples; Resistor, Capacitor, Transistor, DIODE

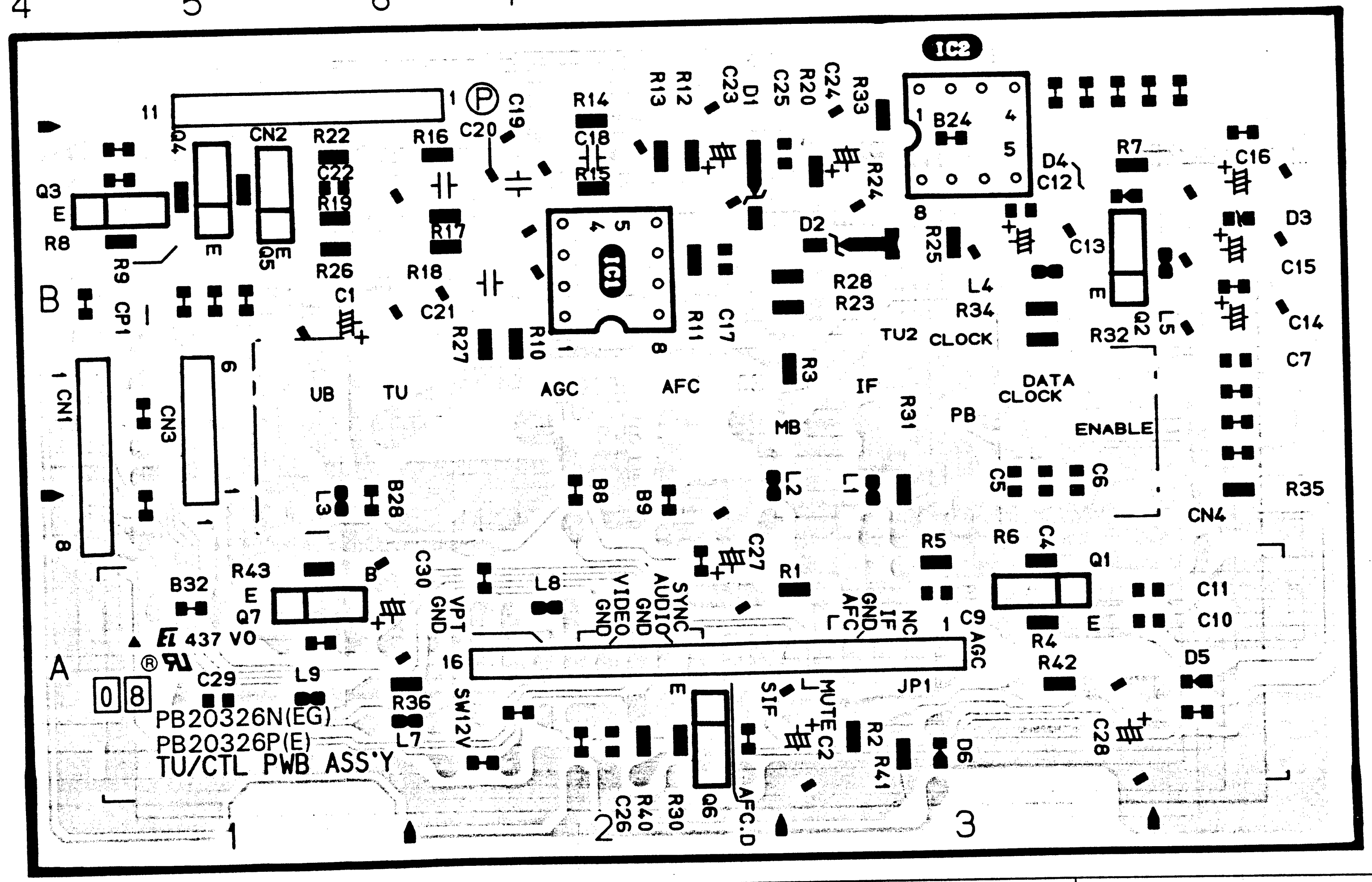


3.19 IF & TNR CTL SCHEMATIC DIAGRAMS

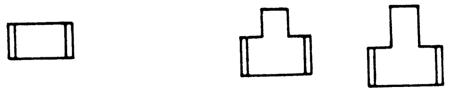

RF CONV & MIXER
Q6 2SC3313CTA
Q2 2SD1863(QR)
Q3 2SB810H,J
Q4 DTC144ES
CN2
GND
A MUTE
TU CTL
PLL DATA
SYNC DET
S/M/P CLK
LOCK DET
DEMOD MUTE
From/To 03 MAIN (MECHACON) CN604 (Page 3-25)
C26 470P
CP1 ICP-F10
UNSW 12V
R8 15K
R9 1.8K
R30 330
C16 10/16
R7 270
D3 RD5.6ES-T1B3
D4
C15 100/16
L5 10
From/To 14 DEMOD CN1 (Page 3-43)
CN3
SIF
GND
AUDIO
MUTE
SWD 12V
DEMOD MUTE
TNR 1
DATA
CLOCK
LOCK
PB
TU2
IF
MB
AGC
TU1
C7 470P
C6 180P
C5 0.001
C4 0.001
R3 15K
R32 10K
C14 33/16
L4 1
D5
C23 10/50
C28 0.47/50
D1 HZT33-02
L1 0.22
L2 6.8
C1 330/16
C2 2.2/50
R2 100K
SWD 12V
L9 5.6
C29 91P
JP1
SWD 12V
GND
VPT
GND
VIDEO
GND
AUDIO
SYNC DET
NC
SIF
MUTE
NC
GND
IF
NC
AGC
R36 56
L7 2.7
D2 E-452-2
CN1
45V
UNSW 12V
GND
VIDEO
VPT VIDEO
GND
To 03 MAIN (VIDEO) CN701 (Page 3-32)
08 TUNER CTL
07 IF
Q4 2SA933S(S)
Q13 DTC144ES
Q15 2SK381(C)
Q10 2SC3354
Q11 2SC1740(RS)
R86 2.2K
R84 39K
R100 1M
R38 1.8K
R40 COLOR LEVEL
R39 2.7K
R85 7.5K
C29 47P
R40 10K
L5 22
R54 8.2K
C33 0.47/50
R52 22K
D6 DA204U
T5 SYNC DET 15.625 KHz
C64 390P
R47 15K
C20 0.001
R102 2.2K
R83 330
C56 33/16
R33 22K
Q7
R51 22K
D6
C32 0.022
C31 3.3/50
R45 470
R101 2.2K
R46 100K
R49 10K
SWD 12V
R82 68
T4 5.5MHz
R53 10K
Q8
Q6
R50 470
R48 3.9K
Q5
CF4 5.5 MHz
R73 470
IC1 M51365SP
C43 0.0022
R62 3.9K
R71 680
L1 0.75
SAW 2
CF1 5.5MHz
C19 0.01
R63 47
C41 0.001
R64 1.8K
Q10
C45 0.001
C46 0.001
C44 0.011
C17 0.022
R24 820
Q12
LIM
C20 0.01
C21 100P
R31 2.2K
R65 220
R72 33
FM DE
L9 6.8
C15 33/16
C16 0.0022
SIF DET
R32 10K
C24 1/50
R5 150
R4 3.9K
R8 680
L2 0.82
C5 0.001
C58 10P
C47 4.7P
C6 0.0022
SAW 1
T2 VCO 38.9MHz
R7 2.2K
Q2
L3 1.5
IF AMP
VCO
C25 0.0022
C2 3.9P
T1 40.37 MHz
Q1
C7 0.001
R1 75
C3 100P
R6 2.7K
C8 0.001
C14 0.47/25
PHASE DET
C27 0.47/50
C50 33/16
L7 0.22
R10 470
R11 100
IF AGC
R34 47
R36 560
R22 820K
AFC
C26 0.0022
T8 250 kHz
L6 6.8
C10 100/16
C11 0.01
C13 0.0022
RF AGC
D1 MTZ10D
R20 2.2K
R21 4.7K
R19 2.2K
VIDEO DET
R35 560
R15 270
R14 100
Q3
R21 RF AGC
R18 3.3K
EQ
LOCK CTL
CF3 5.5MHz
R57 15K
CF5 6.5MHz
R17 5.6K
L4 8.2
R37 100
Q7 2SC1740(RS)
Q6 FMS2
Q5 2SD1819A(R,S)
Q8 2SA1532(C)
Q1 2SA1532(C)
Q2 2SC3354
Q3 2SC1317(RS)
Q12 DTC144EU
A
B
C
D
E
F
G
H
1
2
3
4
5

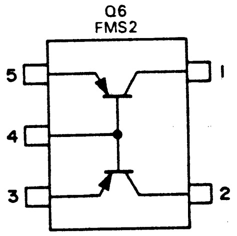
3.20 IF & TNR CTL CIRCUIT BOARDS


-IF-
PB10367 IF PWB
PB10367P IF PWB ASS'Y
R21 RF AGC
T2 VCO
T5 SYNC DET
R40 COLOR LEVEL
IC1
SAW1
SAW2
Q1 Q2 Q3 Q4 Q6 Q7 Q8 Q9 Q10 Q11 Q15
T1 T2 T3 T4 T5 T8
L1 L2 L3 L4 L5 L7 L9
CF1 CF2 CF3 CF4 CF5
JP1
A B C D
1 2 3 4 5 6 7

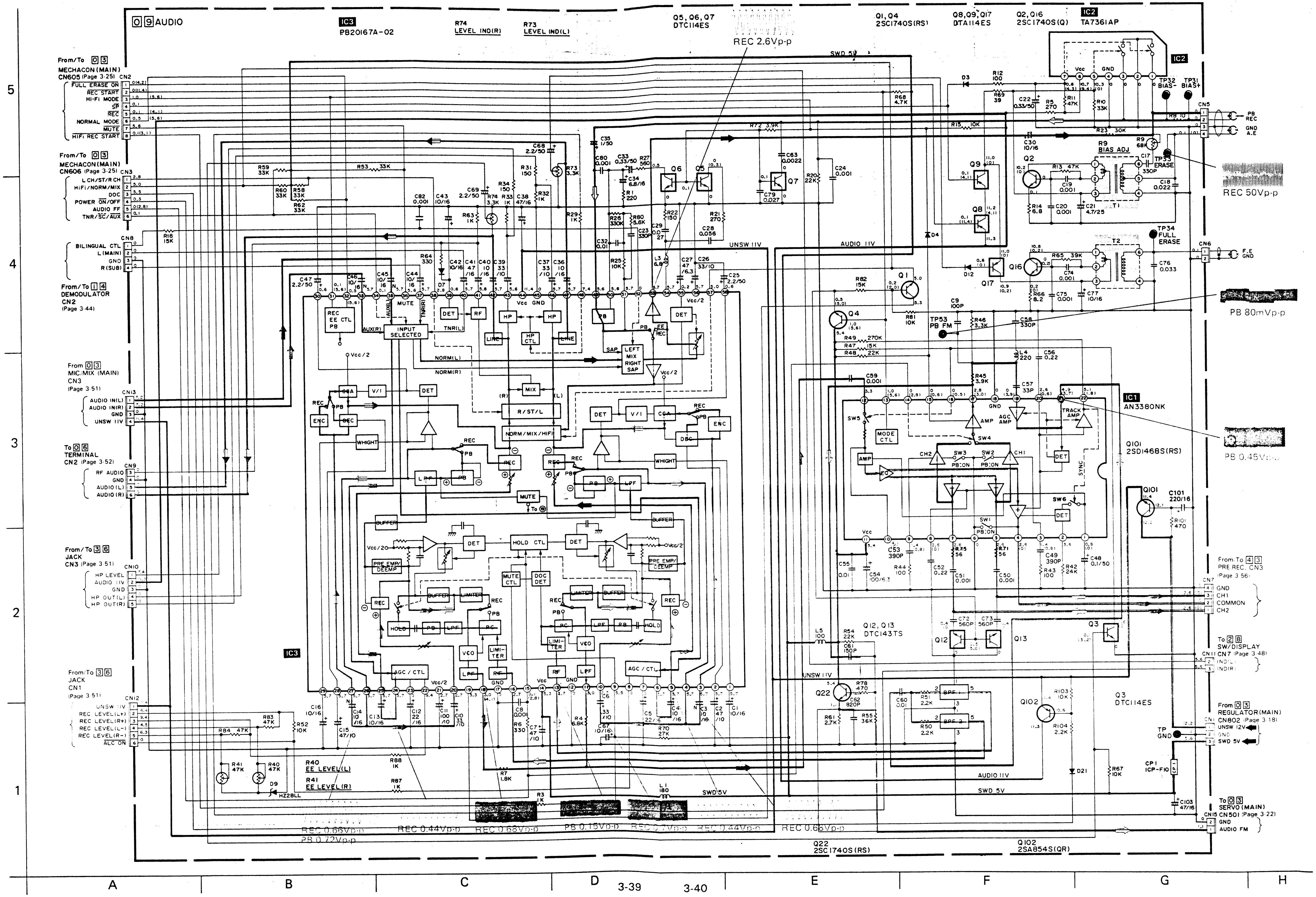

-TNR/CTL-
IC1
IC2
CN1 CN2 CN3 CN4
CP1
JP1
UB TU AGC AFC IF PB MB
TU2 CLOCK
DATA CLOCK
ENABLE
VPT GND
VIDEO GND
AUDIO GND
SYNC
AFC GND
IF NC
AGC
SW12V
MUTE
SIF
AFC.D
437 VO
PB20326N(EG)
PB20326P(E)
TU/CTL PWB ASS'Y
A B
1 2 3

Note: Double edging indicates not used in this model.
Examples; Resistor, Capacitor, Transistor, DIODE

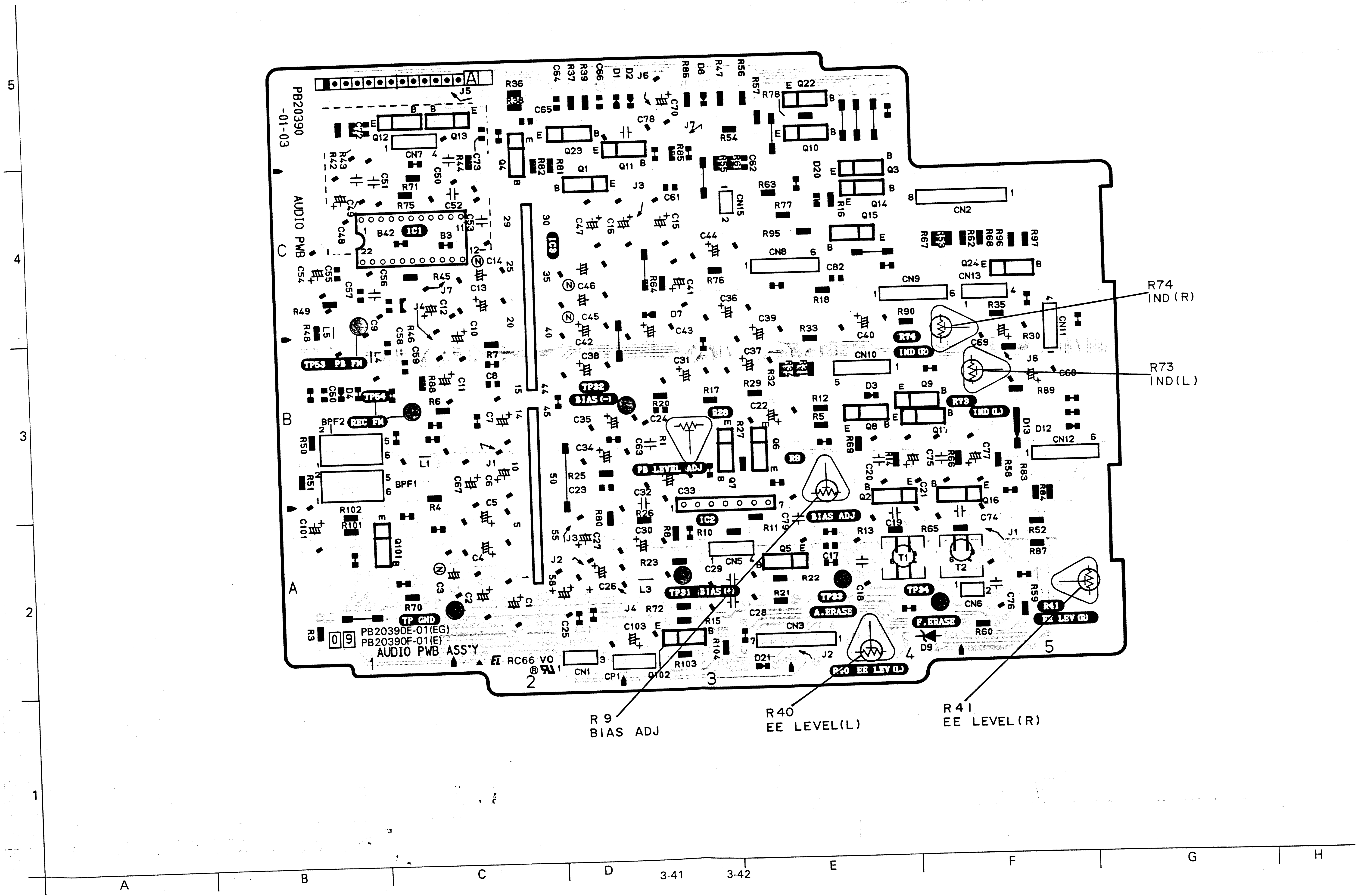



Q6
FMS2
1
2
3
4
5

3.21 AUDIO SCHEMATIC DIAGRAM


09 AUDIO
IC3 PB20167A-02
R74 LEVEL IND(R)
R73 LEVEL IND(L)
Q5, Q6, Q7 DTC114ES
REC 2.6Vp-p
Q1, Q4 2SC1740S(RS)
Q8, Q9, Q17 DTA114ES
Q2, Q16 2SC1740S(Q)
IC2 TA7361AP
From/To 03 MECHACON (MAIN) CN605 (Page 3-25) CN2
FULL ERASE ON
REC START
HI-Fi MODE
SP
REC
NORMAL MODE
MUTE
HIFi REC START
From/To 03 MECHACON (MAIN) CN606 (Page 3-25) CN3
L CH/ST/R CH
HiFi/NORM/MIX
DOC
POWER ON/OFF
AUDIO FF
TNR/SC/AUX
CN8
BILINGUAL CTL
L (MAIN)
GND
R (SUB)
From/To 14 DEMODULATOR CN2 (Page 3-44)
From 03 MIC/MIX (MAIN) CN3 (Page 3-51)
CN13
AUDIO IN(L)
AUDIO IN(R)
GND
UNSW 11V
To 06 TERMINAL CN2 (Page 3-52)
CN9
RF AUDIO
GND
AUDIO (L)
AUDIO (R)
From/To 36 JACK CN3 (Page 3-51) CN10
HP LEVEL
AUDIO 11V
GND
HP OUT(L)
HP OUT(R)
From/To 36 JACK CN1 (Page 3-51) CN12
UNSW 11V
REC LEVEL(L+)
REC LEVEL(R+)
REC LEVEL(L-)
REC LEVEL(R-)
ALC ON
SWD 5V
UNSW 11V
AUDIO 11V
TP32 BIAS-
TP31 BIAS+
CN5
PB REC
GND A.E
R9 BIAS ADJ
TP33 ERASE
REC 50Vp-p
T1
T2
TP34 FULL ERASE
CN6
F.E GND
PB 80mVp-p
TP53 PB FM
IC1 AN3380NK
Q101 2SD1468S(RS)
PB 0.45Vp-p
INPUT SELECTED
REC EE CTL PB
MUTE
DET
RF
HP
LINE
HP CTL
PB
LEFT MIX RIGHT SAP
SAP
EE REC
R/ST/L
NORM/MIX/HIFI
MIX
CCA
V/I
ENC
DEC
WHIGHT
REC
LPF
BUFFER
HOLD CTL
PRE EMP/DEEMP
MUTE CTL
DOC DET
LIMITER
HOLD
PC
VCO
LIMI-TER
AGC/CTL
NORM(L)
NORM(R)
TNR(L)
AUX(R)
MODE CTL
AMP
AGC AMP
TRACK AMP
SW1
SW3
SW2
SW4
SW5
SW6
CH1
CH2
EQ
SYNC
PB:ON
From To 43 PRE REC. CN3 (Page 3-56)
CN7
GND
CH1
COMMON
CH2
To 28 SW/DISPLAY CN7 (Page 3-48)
CN11
IND(L)
IND(R)
From 03 REGULATOR (MAIN) CN802 (Page 3-18)
UNSW 12V
GND
SWD 5V
TP GND
CP1 ICP-F10
To 03 SERVO (MAIN) CN501 (Page 3-22)
CN15
GND
AUDIO FM
Q12, Q13 DTC143TS
Q3 DTC114ES
Q22 2SC1740S(RS)
Q102 2SA854S(QR)
BPF 1
BPF 2
R40 EE LEVEL(L)
R41 EE LEVEL(R)
HZ28LL
REC 0.66Vp-p
PB 0.72Vp-p
REC 0.44Vp-p
REC 0.68Vp-p
PB 0.15Vp-p
REC 0.7Vp-p
REC 0.44Vp-p
REC 0.66Vp-p
A
B
C
D
E
F
G
H
1
2
3
4
5

3.22 AUDIO CIRCUIT BOARD


PB20390
-01-03
AUDIO PWB
PB20390E-01(EG)
PB20390F-01(E)
AUDIO PWB ASS'Y
RC66 V0
IC1
IC2
IC3
CN1
CN2
CN3
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN15
BPF1
BPF2
T1
T2
TP53 PB FM
TP54
REC FM
TP GND
TP32
BIAS(-)
TP31 BIAS(+)
TP33
A.ERASE
TP34
F.ERASE
PB LEVEL ADJ
BIAS ADJ
R74
IND(R)
R73
IND(L)
R40 EE LEV(L)
R41
EE LEV(R)
1
2
3
4
5
A
B
C
D
E
F
G
H

R74
IND(R)

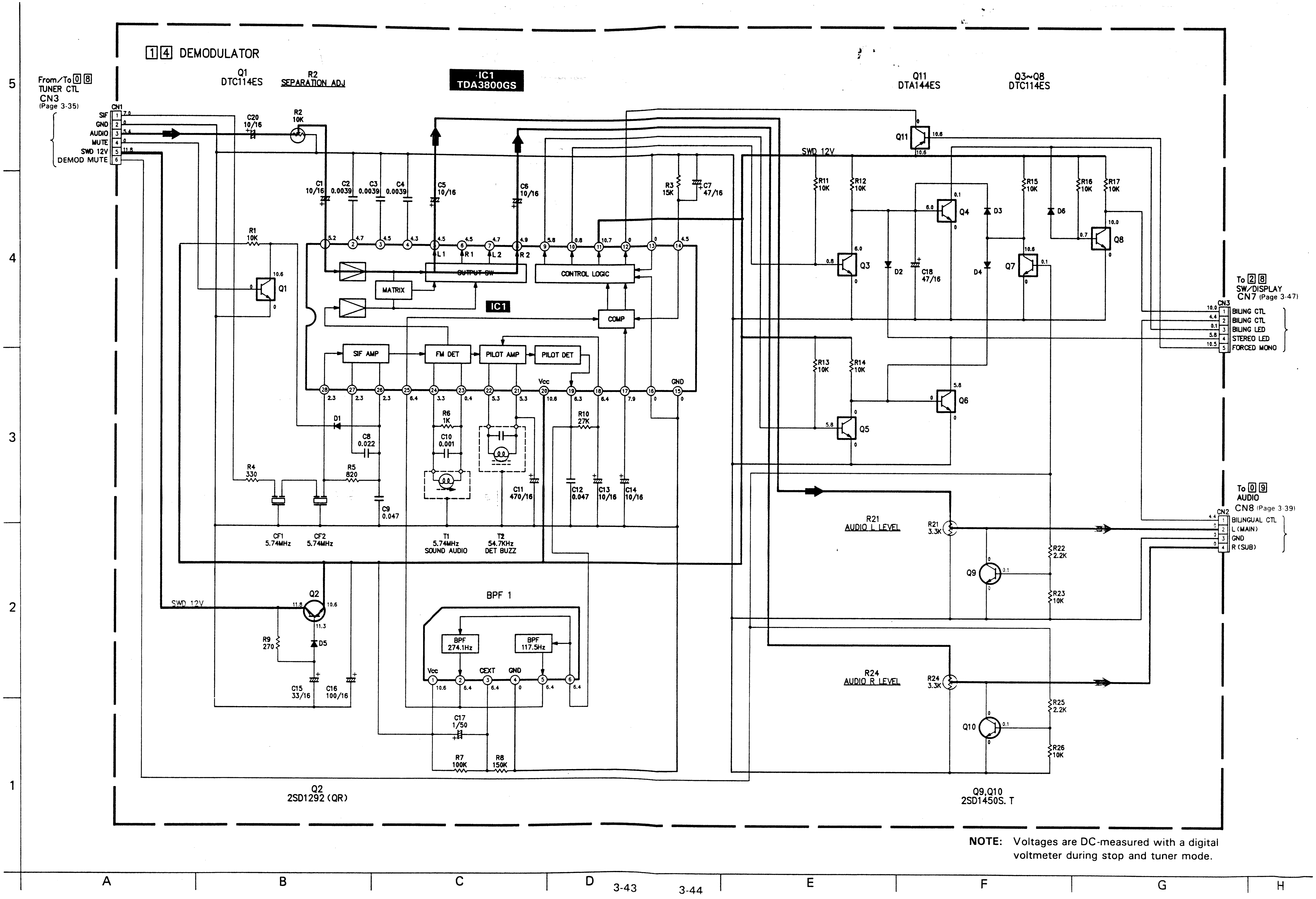
R73
IND(L)

R9
BIAS ADJ

R40
EE LEVEL(L)

R41
EE LEVEL(R)

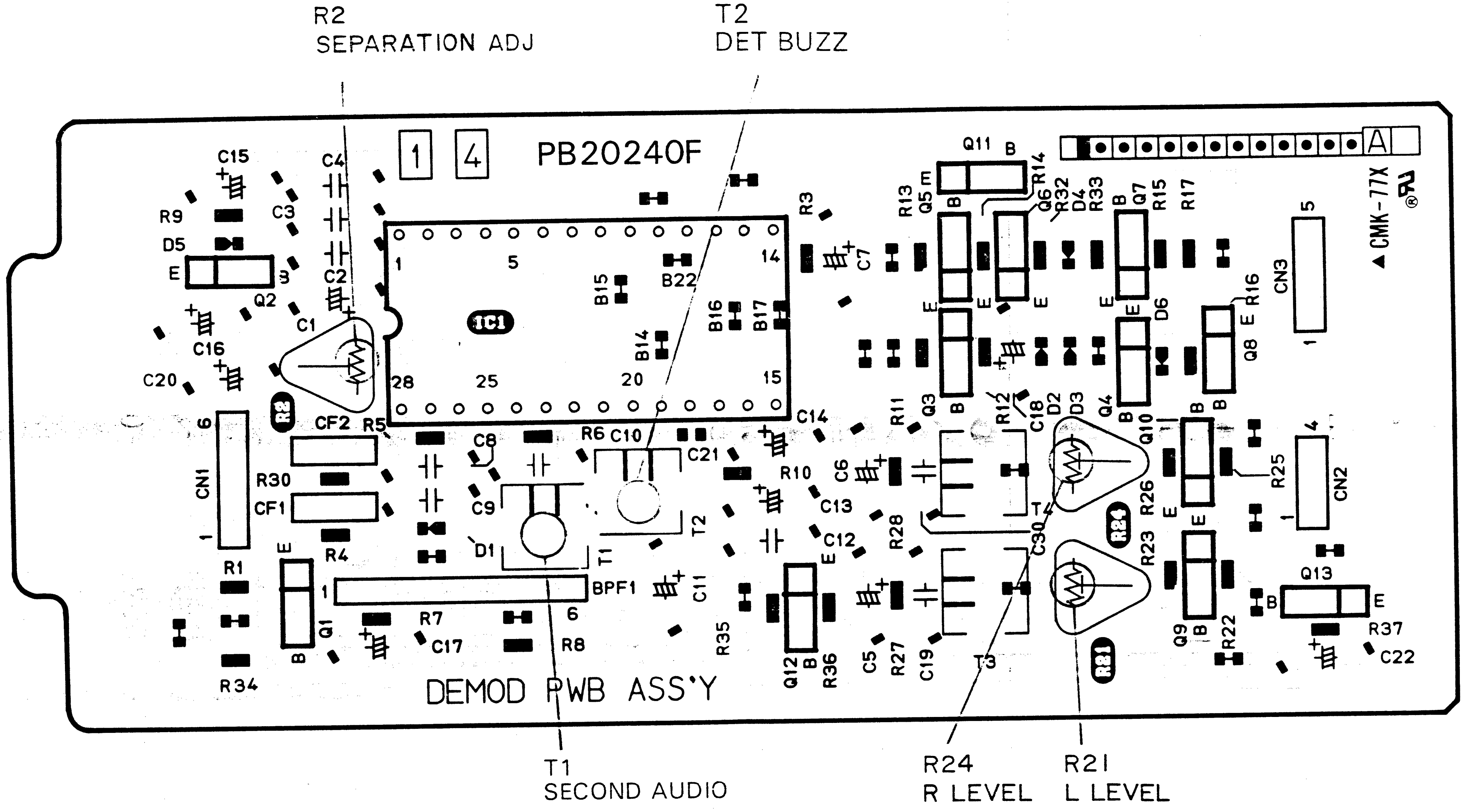
3.23 DEMODULATOR SCHEMATIC DIAGRAM



1 4 DEMODULATOR
From/To 0 8
TUNER CTL
CN3
(Page 3-35)
CN1
SIF
GND
AUDIO
MUTE
SWD 12V
DEMOD MUTE
Q1
DTC114ES
R2
SEPARATION ADJ
IC1
TDA3800GS
Q11
DTA144ES
Q3~Q8
DTC114ES
C20
10/16
R2
10K
C1
10/16
C2
0.0039
C3
0.0039
C4
0.0039
C5
10/16
C6
10/16
R3
15K
C7
47/16
SWD 12V
R11
10K
R12
10K
R15
10K
R16
10K
R17
10K
Q4
D3
D6
Q8
Q3
D2
C18
47/16
D4
Q7
R1
10K
Q1
L1
R1
L2
R2
OUTPUT SW
CONTROL LOGIC
MATRIX
IC1
COMP
SIF AMP
FM DET
PILOT AMP
PILOT DET
Vcc
GND
R13
10K
R14
10K
Q6
Q5
To 2 8
SW/DISPLAY
CN7 (Page 3-47)
CN3
BILING CTL
BILNG CTL
BILNG LED
STEREO LED
FORCED MONO
D1
C8
0.022
R6
1K
C10
0.001
R10
27K
R4
330
R5
820
C9
0.047
C11
470/16
C12
0.047
C13
10/16
C14
10/16
CF1
5.74MHz
CF2
5.74MHz
T1
5.74MHz
SOUND AUDIO
T2
54.7KHz
DET BUZZ
R21
AUDIO L LEVEL
R21
3.3K
To 0 9
AUDIO
CN8 (Page 3-39)
CN2
BILINGUAL CTL
L (MAIN)
GND
R (SUB)
R22
2.2K
Q9
R23
10K
Q2
SWD 12V
BPF 1
BPF
274.1Hz
BPF
117.5Hz
Vcc
CEXT
GND
R9
270
D5
C15
33/16
C16
100/16
R24
AUDIO R LEVEL
R24
3.3K
R25
2.2K
Q10
R26
10K
C17
1/50
R7
100K
R8
150K
Q2
2SD1292 (QR)
Q9,Q10
2SD1450S. T
A
B
C
D
E
F
G
H
1
2
3
4
5

NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

3.24 DEMODULATOR CIRCUIT BOARD


PB20240F
1
4
IC1
DEMOD PWB ASS'Y
CMK-77X
A
CN1
CN2
CN3
CF1
CF2
BPF1
T1
T2
T3
T4
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
D1
D2
D3
D4
D5
D6
B14
B15
B16
B17
B22
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C30
R1
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R22
R23
R25
R26
R27
R28
R30
R32
R33
R34
R35
R36
R37
E
B

R2
SEPARATION ADJ

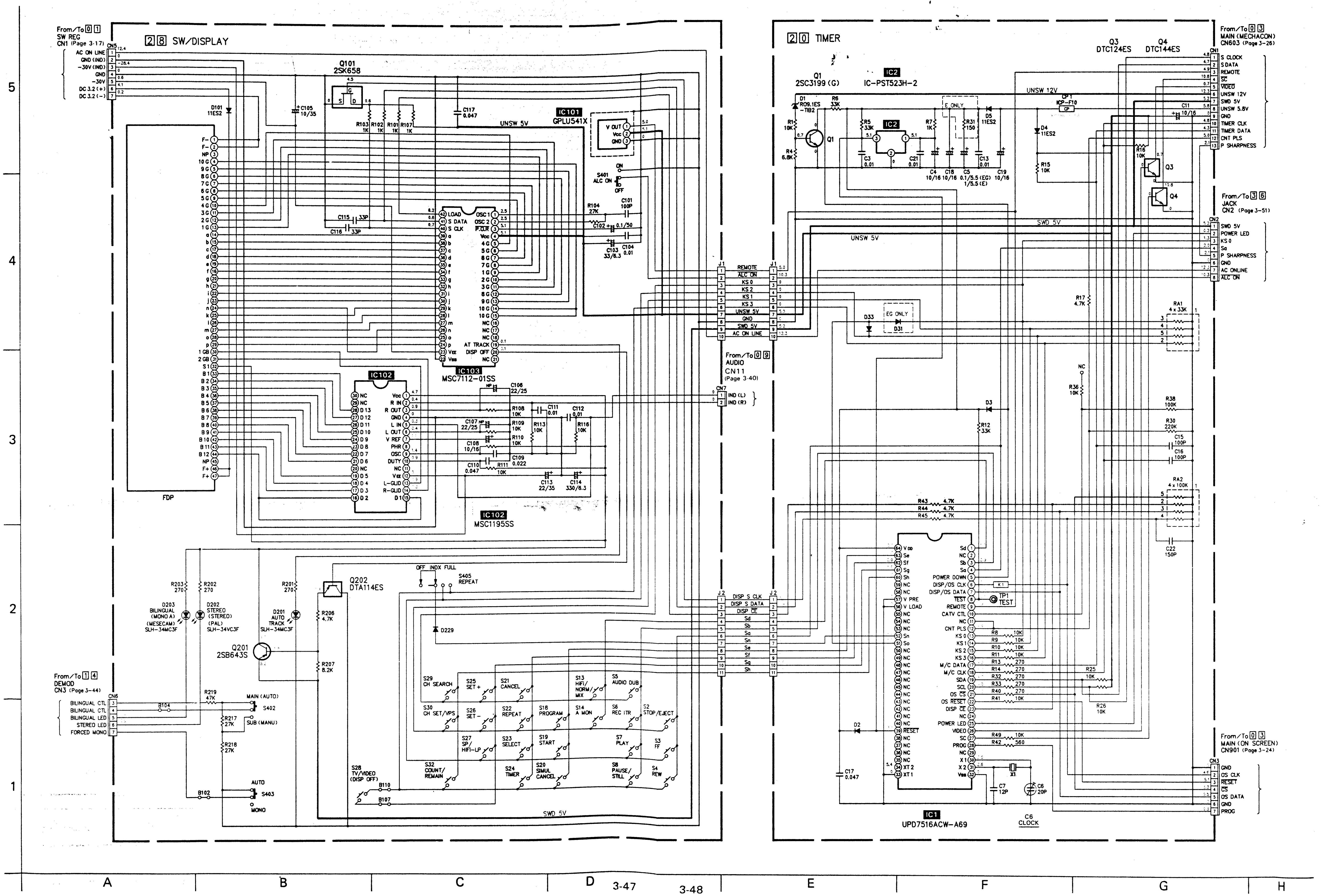
T2
DET BUZZ

T1
SECOND AUDIO

R24
R LEVEL

R21
L LEVEL

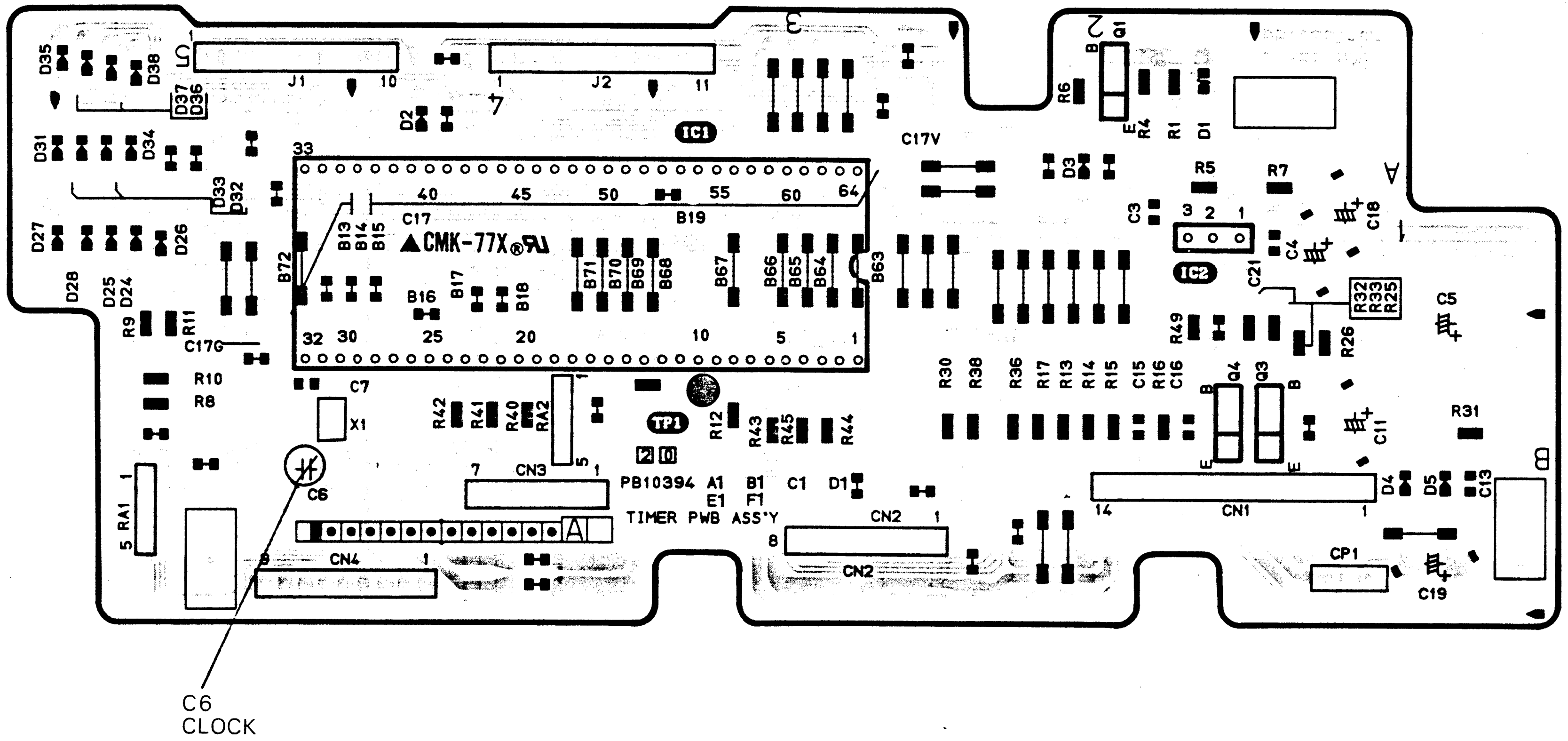
3.25 TIMER AND SW/DISPLAY SCHEMATIC DIAGRAMS



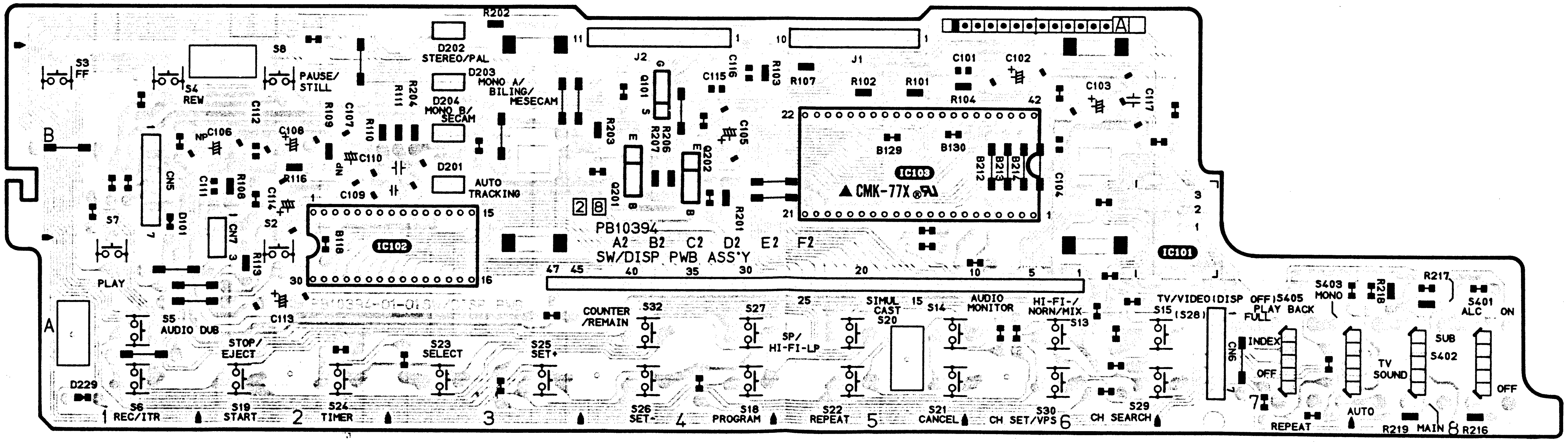
28 SW/DISPLAY
20 TIMER
From/To 0 1 SW REG CN1 (Page 3-17)
AC ON LINE
GND (IND)
-30V (IND)
GND
-30V
DC 3.2 (+)
DC 3.2 (-)
D101 11ES2
C105 10/35
Q101 2SK658
R103 1K
R102 1K
R101 1K
R107 1K
C117 0.047
UNSW 5V
IC101 GP1U541X
V OUT
Vcc
GND
S401 ALC ON OFF
R104 27K
C101 100P
C102 0.1/50
C103 33/6.3
C104 0.01
C115 33P
C116 33P
IC103 MSC7112-01SS
LOAD
S DATA
S CLK
OSC 1
OSC 2
P.ON
AT TRACK
DISP OFF
FDP
IC102 MSC1195SS
C106 22/25
R108 10K
C111 0.01
C112 0.01
C107 22/25
R109 10K
R113 10K
R116 10K
C108 10/16
R110 10K
C109 0.022
C110 0.047
R111 10K
C113 22/35
C114 330/6.3
J1
REMOTE
ALC ON
KS 0
KS 2
KS 1
KS 3
UNSW 5V
GND
SWD 5V
AC ON LINE
From/To 0 9 AUDIO CN11 (Page 3-40)
CN7
IND (L)
IND (R)
J2
DISP S CLK
DISP S DATA
DISP CE
Sd
Sb
Sa
Sn
Se
Sf
Sg
Sh
R203 270
R202 270
R201 270
D203 BILINGUAL (MONO A) (MESECAM) SLH-34MC3F
D202 STEREO (STEREO) (PAL) SLH-34VC3F
D201 AUTO TRACK SLH-34MC3F
Q201 2SB643S
Q202 DTA114ES
R206 4.7K
R207 8.2K
OFF INDX FULL
S405 REPEAT
D229
From/To 1 4 DEMOD CN3 (Page 3-44)
CN6
BILINGUAL CTL
BILINGUAL CTL
BILINGUAL LED
STEREO LED
FORCED MONO
B104
R219 47K
MAIN (AUTO)
S402
SUB (MANU)
R217 27K
R218 27K
AUTO
S403
MONO
B102
S29 CH SEARCH
S25 SET+
S21 CANCEL
S13 HIFI/NORM/MIX
S5 AUDIO DUB
S30 CH SET/VPS
S26 SET-
S22 REPEAT
S18 PROGRAM
S14 A MON
S6 REC ITR
S2 STOP/EJECT
S27 SP/HIFI-LP
S23 SELECT
S19 START
S7 PLAY
S3 FF
S28 TV/VIDEO (DISP OFF)
S32 COUNT/REMAIN
S24 TIMER
S20 SIMUL CANCEL
S8 PAUSE/STILL
S4 REW
B110
B107
SWD 5V
Q1 2SC3199 (G)
IC2 IC-PST523H-2
D1 R09.1ES -11B2
R6 33K
R1 10K
R4 6.8K
R5 33K
C3 0.01
C21 0.01
R7 1K
R31 150
E ONLY
D5 11ES2
C13 0.01
C4 10/16
C18 10/16
C5 0.1/5.5 (EG) 1/5.5 (E)
C19 10/16
UNSW 12V
CP1 ICP-F10
D4 11ES2
R15 10K
R16 10K
C11 10/16
Q3 DTC124ES
Q4 DTC144ES
From/To 0 3 MAIN (MECHACON) CN603 (Page 3-26)
CN1
S CLOCK
S DATA
REMOTE
SC
VIDEO
UNSW 12V
SWD 5V
UNSW 5.8V
GND
TIMER CLK
TIMER DATA
CNT PLS
P SHARPNESS
From/To 3 6 JACK CN2 (Page 3-51)
CN2
SWD 5V
POWER LED
KS 0
Sa
P SHARPNESS
GND
AC ONLINE
ALC ON
EG ONLY
D33
D31
R17 4.7K
RA1 4 x 33K
NC
R36 10K
D3
R12 33K
R38 100K
R30 220K
C15 100P
C16 100P
RA2 4 x 100K
R43 4.7K
R44 4.7K
R45 4.7K
C22 150P
K1
TP1 TEST
R8 10K
R9 10K
R10 10K
R11 10K
R13 270
R14 270
R32 270
R33 270
R40 270
R41 10K
R25 10K
R26 10K
R49 10K
R42 560
D2
C17 0.047
X1
C7 12P
C6 20P
C6 CLOCK
IC1 UPD7516ACW-A69
V DD
V PRE
V LOAD
RESET
XT 2
XT 1
POWER DOWN
DISP/OS CLK
DISP/OS DATA
TEST
CATV CTL
CNT PLS
M/C DATA
M/C CLK
SDA
SCL
OS CS
OS RESET
DISP CE
POWER LED
VIDEO
SC
PROG
X 1
X 2
Vss
From/To 0 3 MAIN (ON SCREEN) CN901 (Page 3-24)
CN3
GND
OS CLK
RESET
CS
OS DATA
GND
PROG
1
2
3
4
5
A
B
C
D
E
F
G
H

3.26 TIMER AND SW/DISPLAY CIRCUIT BOARDS

—TIMER—


J1
J2
IC1
CMK-77X
C17V
IC2
Q1
Q3
Q4
R5
R7
C3
C4
C5
C6
C7
C11
C13
C17
C18
C19
C21
X1
TP1
2 0
CN1
CN2
CN3
CN4
CP1
RA1
RA2
B19
B63
B72
PB10394 A1 B1 C1 D1
E1 F1
TIMER PWB ASS'Y
C6
CLOCK

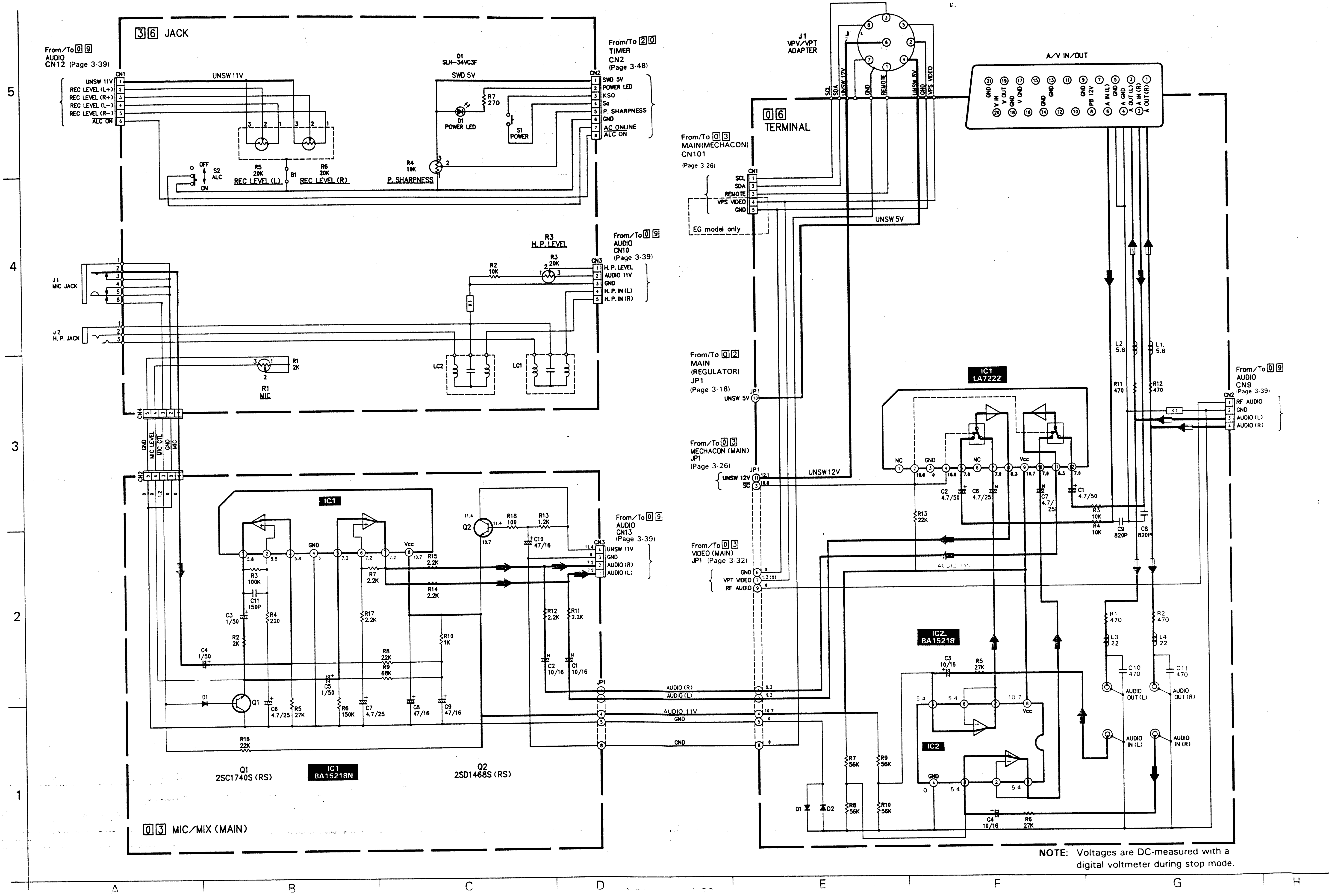
—SW/DISPLAY—


R202
D202 STEREO/PAL
D203 MONO A/ BILING/ MESECAM
D204 MONO B/ SECAM
D201 AUTO TRACKING
J2
J1
IC102
IC103
CMK-77X
IC101
Q201
Q202
2 8
PB10394
A2 B2 C2 D2 E2 F2
SW/DISP PWB ASS'Y
S3 FF
S4 REW
S8 PAUSE/ STILL
S7 PLAY
S2
S5 AUDIO DUB
STOP/ EJECT
S6 REC/ITR
S19 START
S24 TIMER
S23 SELECT
S25 SET+
COUNTER /REMAIN
S32
S26 SET-
S27
SP/ HI-FI-LP
S18 PROGRAM
SIMUL CAST S20
S22 REPEAT
S14
AUDIO MONITOR
S21 CANCEL
HI-FI-/ NORN/MIX
S13
S30 CH SET/VPS
TV/VIDEO(DISP OFF)S405
S15 (S28)
S29 CH SEARCH
PLAY BACK FULL
INDEX
OFF
REPEAT
S403 MONO
TV SOUND
AUTO
SUB
S402
MAIN
S401 ALC
ON
OFF
R217
R219
R216
CN5
CN6
CN7
D229
A
B
1
2
3
4
5
6
7
8

5
4
3
2
1

A B C D E F G H

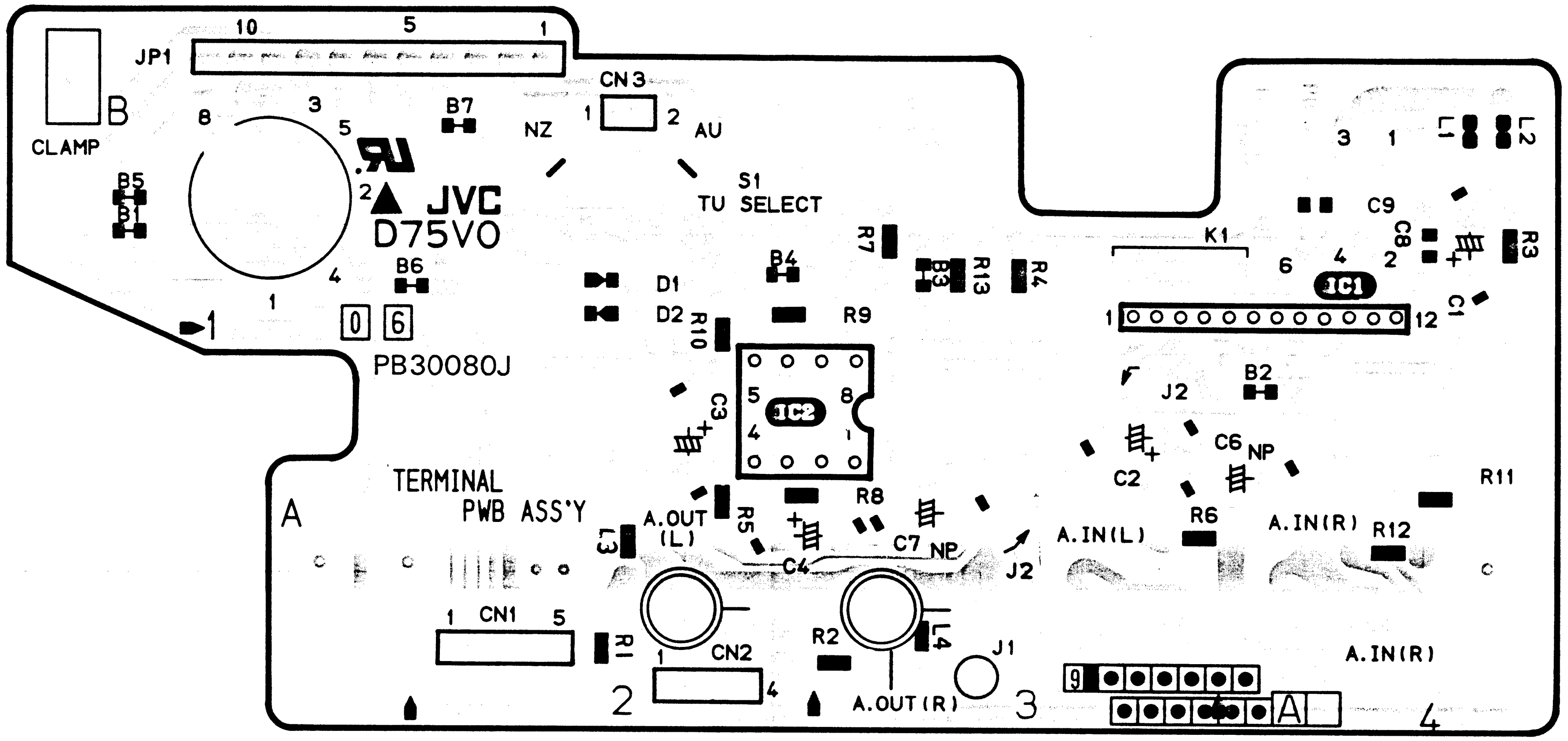
3.27 MIC/MIX (MAIN), TERMINAL AND JACK SCHEMATIC DIAGRAMS


36 JACK
From/To 09 AUDIO CN12 (Page 3-39)
CN1
UNSW 11V
REC LEVEL (L+)
REC LEVEL (R+)
REC LEVEL (L−)
REC LEVEL (R−)
ALC ON
UNSW11V
D1 SLH-34VC3F
SWD 5V
R7 270
D1 POWER LED
S1 POWER
R5 20K REC LEVEL (L)
R6 20K REC LEVEL (R)
B1
S2 ALC OFF ON
R4 10K P. SHARPNESS
From/To 20 TIMER CN2 (Page 3-48)
CN2
SWD 5V
POWER LED
KSO
Sa
P. SHARPNESS
GND
AC ONLINE
ALC ON
R3 H. P. LEVEL
R2 10K
R3 20K
From/To 09 AUDIO CN10 (Page 3-39)
CN3
H. P. LEVEL
AUDIO 11V
GND
H. P. IN (L)
H. P. IN (R)
J1 MIC JACK
J2 H. P. JACK
R1 2K
R1 MIC
LC2
LC1
CN4
GND
MIC LEVEL
MIC CTL
GND
MIC
CN2
IC1
GND
Vcc
R15 2.2K
R7 2.2K
R14 2.2K
R3 100K
C11 150P
C3 1/50
R4 220
R17 2.2K
R2 2K
R10 1K
C4 1/50
R8 22K
R9 68K
C5 1/50
D1
Q1
C6 4.7/25
R5 27K
R6 150K
C7 4.7/25
C8 47/16
C9 47/16
R16 22K
Q2
R18 100
R13 1.2K
C10 47/16
From/To 09 AUDIO CN13 (Page 3-39)
CN3
UNSW 11V
GND
AUDIO (R)
AUDIO (L)
R12 2.2K
R11 2.2K
C2 10/16
C1 10/16
JP1
Q1 2SC1740S (RS)
IC1 BA15218N
Q2 2SD1468S (RS)
03 MIC/MIX (MAIN)
J1 VPV/VPT ADAPTER
SCL
SDA
UNSW 12V
GND
REMOTE
UNSW 5V
GND
VPS VIDEO
A/V IN/OUT
06 TERMINAL
From/To 03 MAIN(MECHACON) CN101 (Page 3-26)
CN1
SCL
SDA
REMOTE
VPS VIDEO
GND
EG model only
UNSW 5V
From/To 02 MAIN (REGULATOR) JP1 (Page 3-18)
UNSW 5V
From/To 03 MECHACON (MAIN) JP1 (Page 3-26)
UNSW 12V
SC
UNSW12V
From/To 03 VIDEO (MAIN) JP1 (Page 3-32)
GND
VPT VIDEO
RF AUDIO
AUDIO (R)
AUDIO (L)
AUDIO 11V
GND
GND
IC1 LA7222
NC
GND
NC
Vcc
C2 4.7/50
C6 4.7/25
C7 4.7/25
C1 4.7/50
R13 22K
R3 10K
R4 10K
C9 820P
C8 820P
L2 5.6
L1 5.6
R11 470
R12 470
From/To 09 AUDIO CN9 (Page 3-39)
CN2
RF AUDIO
GND
AUDIO (L)
AUDIO (R)
IC2 BA15218
C3 10/16
R5 27K
Vcc
IC2
GND
R7 56K
R9 56K
R8 56K
R10 56K
D1
D2
C4 10/16
R6 27K
R1 470
R2 470
L3 22
L4 22
C10 470
C11 470
AUDIO OUT (L)
AUDIO OUT (R)
AUDIO IN (L)
AUDIO IN (R)
5
4
3
2
1
A
B
C
D
E
F
G
H

NOTE: Voltages are DC-measured with a digital voltmeter during stop mode.

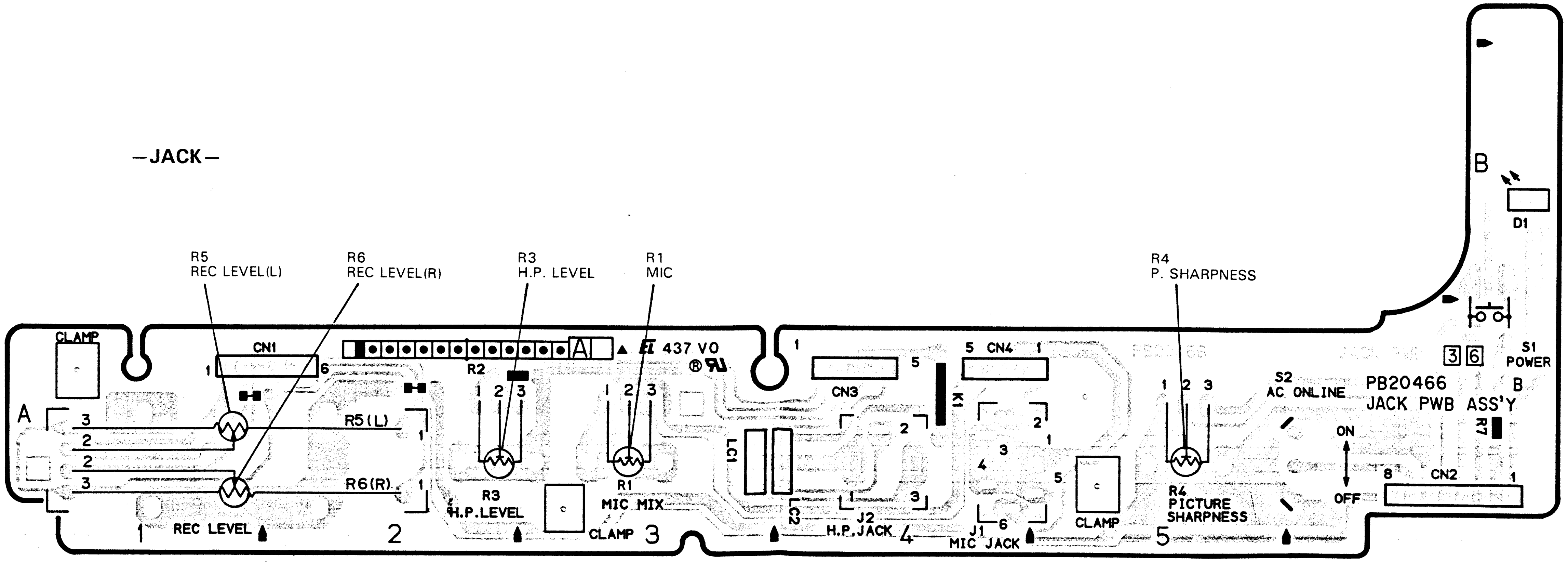
3.28 TERMINAL AND JACK CIRCUIT BOARDS

—TERMINAL—



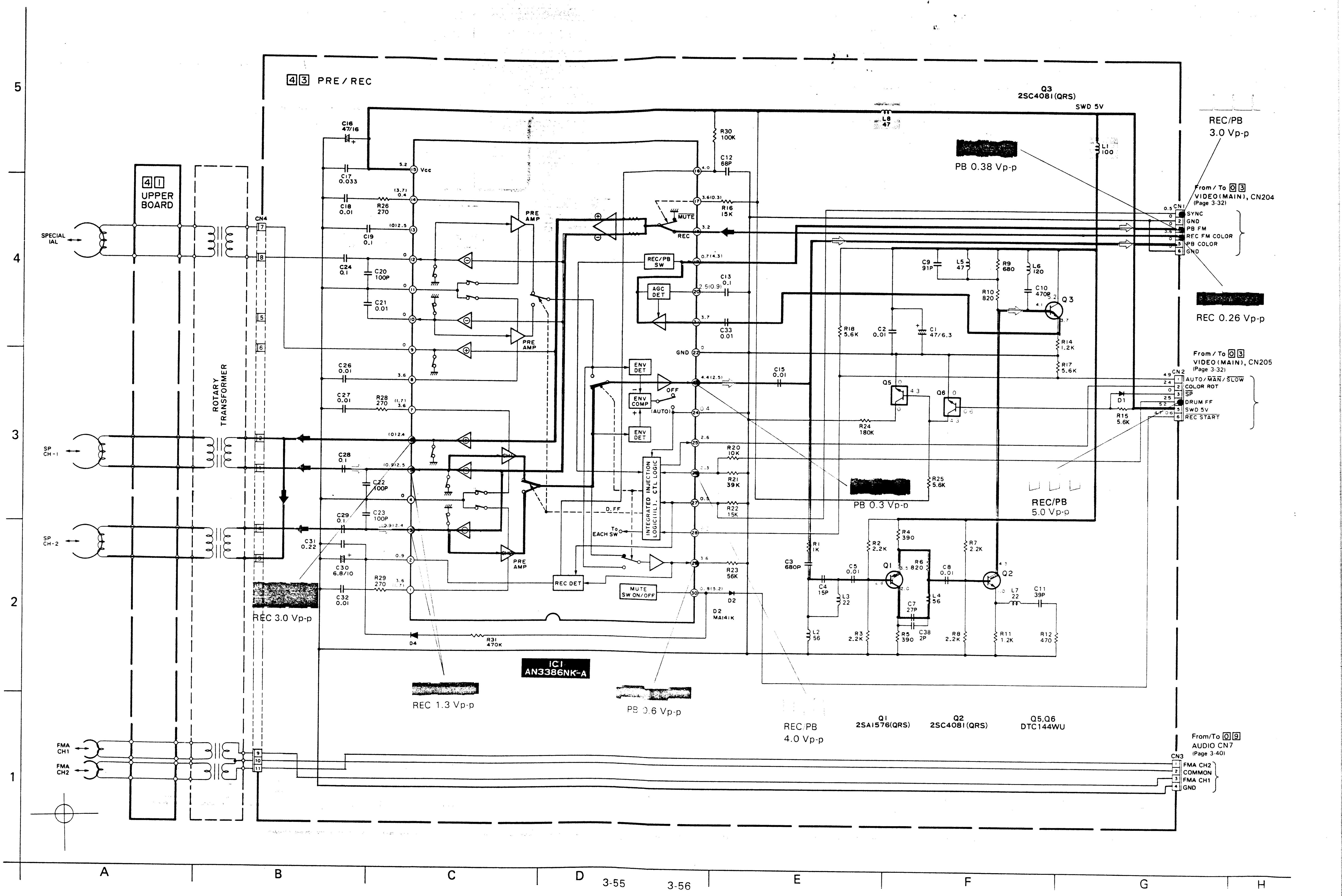
JP1
10
5
1
CLAMP
B
CN3
NZ
AU
B7
S1
TU SELECT
JVC
D75V0
B5
B1
B6
0 6
PB30080J
R7
B4
B3
R13
R4
K1
C9
C8
R3
L1
L2
IC1
C1
1
12
D1
D2
R10
R9
IC2
C3
J2
B2
C6 NP
C2
R6
R11
A.IN(L)
A.IN(R)
R12
TERMINAL
PWB ASS'Y
A
L3
A.OUT (L)
R5
R8
C4
C7 NP
CN1
R1
CN2
R2
L4
J1
A.OUT(R)
A.IN(R)
2
3
4

—JACK—

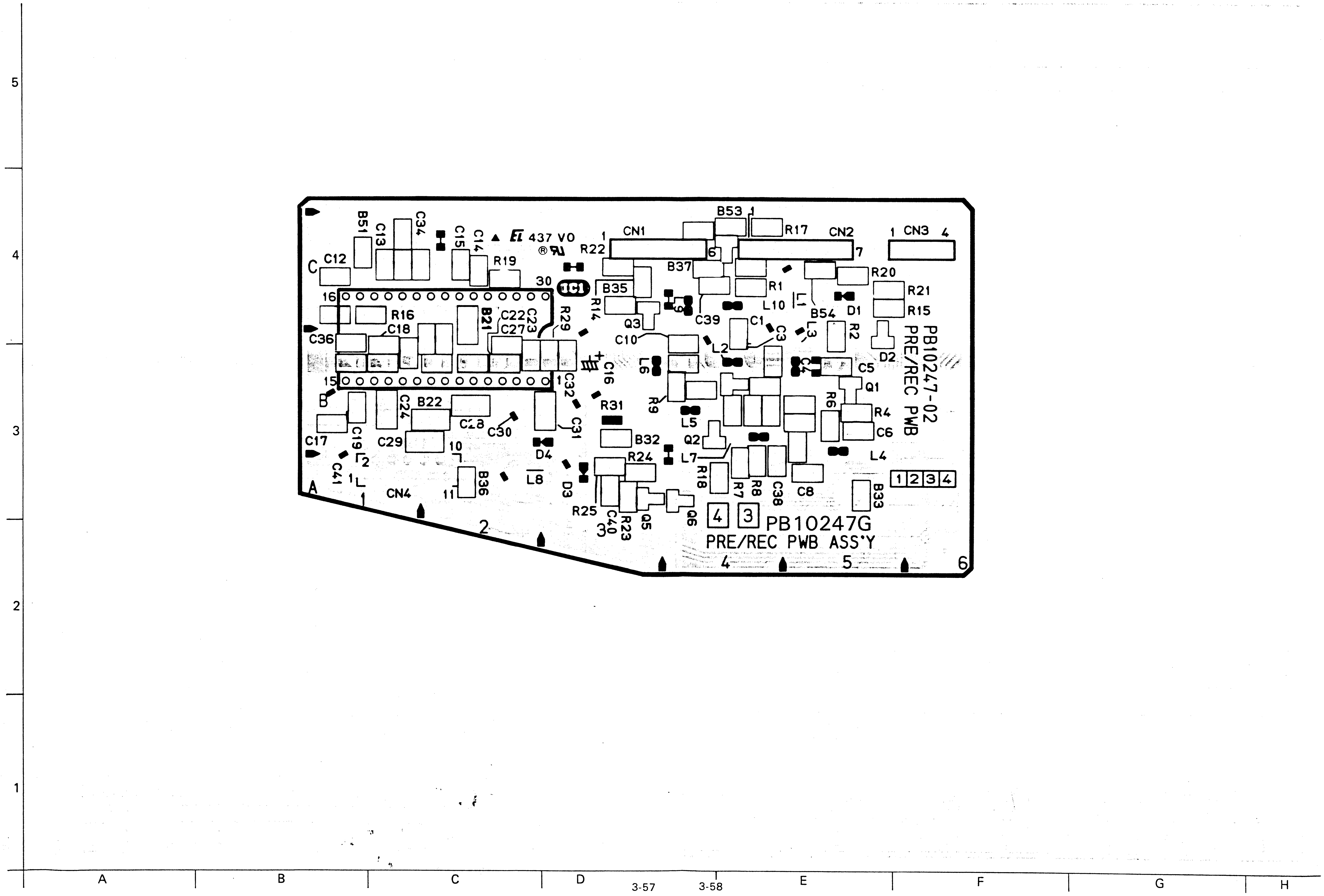


R5
REC LEVEL(L)
R6
REC LEVEL(R)
R3
H.P. LEVEL
R1
MIC
R4
P. SHARPNESS
CLAMP
CN1
R2
437 V0
CN3
CN4
K1
B
D1
S1
POWER
S2
AC ONLINE
PB20466
JACK PWB ASS'Y
R7
ON
OFF
CN2
A
R5(L)
R6(R)
REC LEVEL
R3
H.P.LEVEL
R1
MIC MIX
CLAMP
LC1
LC2
J2
H.P. JACK
J1
MIC JACK
CLAMP
R4
PICTURE
SHARPNESS
1
2
3
4
5

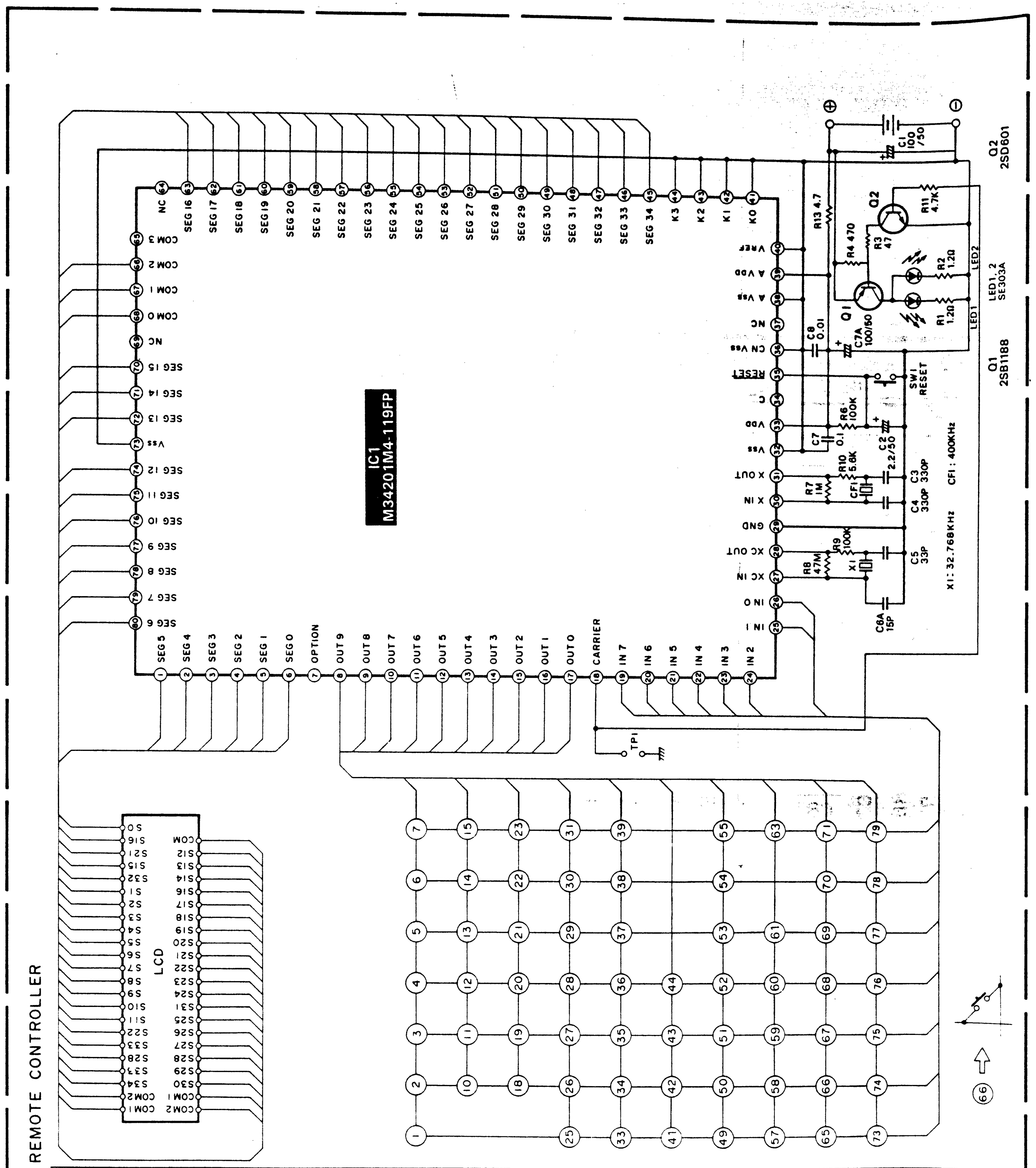
3.29 PRE/REC SCHEMATIC DIAGRAM


43 PRE/REC
41 UPPER BOARD
ROTARY TRANSFORMER
SPECIAL
SP CH-1
SP CH-2
FMA CH1
FMA CH2
CN4
C16 47/16
C17 0.033
C18 0.01
R26 270
C19 0.1
C24 0.1
C20 100P
C21 0.01
C26 0.01
C27 0.01
R28 270
C28 0.1
C22 100P
C29 0.1
C23 100P
C31 0.22
C30 6.8/10
C32 0.01
R29 270
Vcc
PRE AMP
R30 100K
C12 68P
R16 15K
MUTE
REC
REC/PB SW
AGC DET
C13 0.1
C33 0.01
GND
ENV DET
ENV COMP
OFF
(AUTO)
INTEGRATED INJECTION LOGIC(IIL) CTL LOGIC
D.FF
To EACH SW
REC DET
MUTE SW ON/OFF
R20 10K
R21 39K
R22 15K
R23 56K
D2 MA141K
D4
R31 470K
IC1 AN3386NK-A
C15 0.01
L8 47
Q3 2SC4081(QRS)
SWD 5V
L1 100
PB 0.38 Vp-p
REC/PB 3.0 Vp-p
From/To 03 VIDEO(MAIN), CN204 (Page 3-32)
CN1
SYNC
GND
PB FM
REC FM COLOR
PB COLOR
GND
REC 0.26 Vp-p
C9 91P
L5 47
R9 680
L6 120
R10 820
C10 470P
Q3
R18 5.6K
C2 0.01
C1 47/6.3
R14 1.2K
R17 5.6K
From/To 03 VIDEO(MAIN), CN205 (Page 3-32)
CN2
AUTO/MAN/SLOW
COLOR ROT
SP
DRUM FF
SWD 5V
REC START
Q5
Q6
D1
R15 5.6K
R24 180K
R25 5.6K
PB 0.3 Vp-p
REC/PB 5.0 Vp-p
R1 1K
R2 2.2K
R4 390
R6 820
R7 2.2K
C3 680P
C5 0.01
C8 0.01
Q1
Q2
C4 15P
L3 22
C7 27P
L4 56
L7 22
C11 39P
L2 56
R3 2.2K
R5 390
C38 2P
R8 2.2K
R11 1.2K
R12 470
REC 3.0 Vp-p
REC 1.3 Vp-p
PB 0.6 Vp-p
REC/PB 4.0 Vp-p
Q1 2SA1576(QRS)
Q2 2SC4081(QRS)
Q5,Q6 DTC144WU
From/To 09 AUDIO CN7 (Page 3-40)
CN3
FMA CH2
COMMON
FMA CH1
GND
1
2
3
4
5
A
B
C
D
E
F
G
H

3.30 PRE/REC CIRCUIT BOARD


PB10247-02
PRE/REC PWB
PB10247G
PRE/REC PWB ASS'Y
437 V0
CN1
CN2
CN3
CN4
IC1
B51
C13
C34
C15
C14
R19
R22
B53
R17
R20
R21
R15
C12
B35
B37
R1
L10
L1
D1
B54
R2
R14
Q3
C39
C1
C3
L3
R16
B21
C22
C23
C27
C18
C36
R29
C10
L2
L6
C16
C4
C5
D2
Q1
C32
R31
R9
L5
R6
R4
C6
B22
C24
C28
C30
C31
C17
C19
C29
B32
Q2
L7
L4
C41
D4
R24
B36
L8
D3
R18
R7
R8
C38
C8
B33
R25
C40
R23
Q5
Q6
1
2
3
4
5
6
7
10
11
15
16
30
A
B
C
1 2 3 4
A
B
C
D
E
F
G
H
1
2
3
4
5

3.31 REMOTE CONTROL SCHEMATIC DIAGRAM

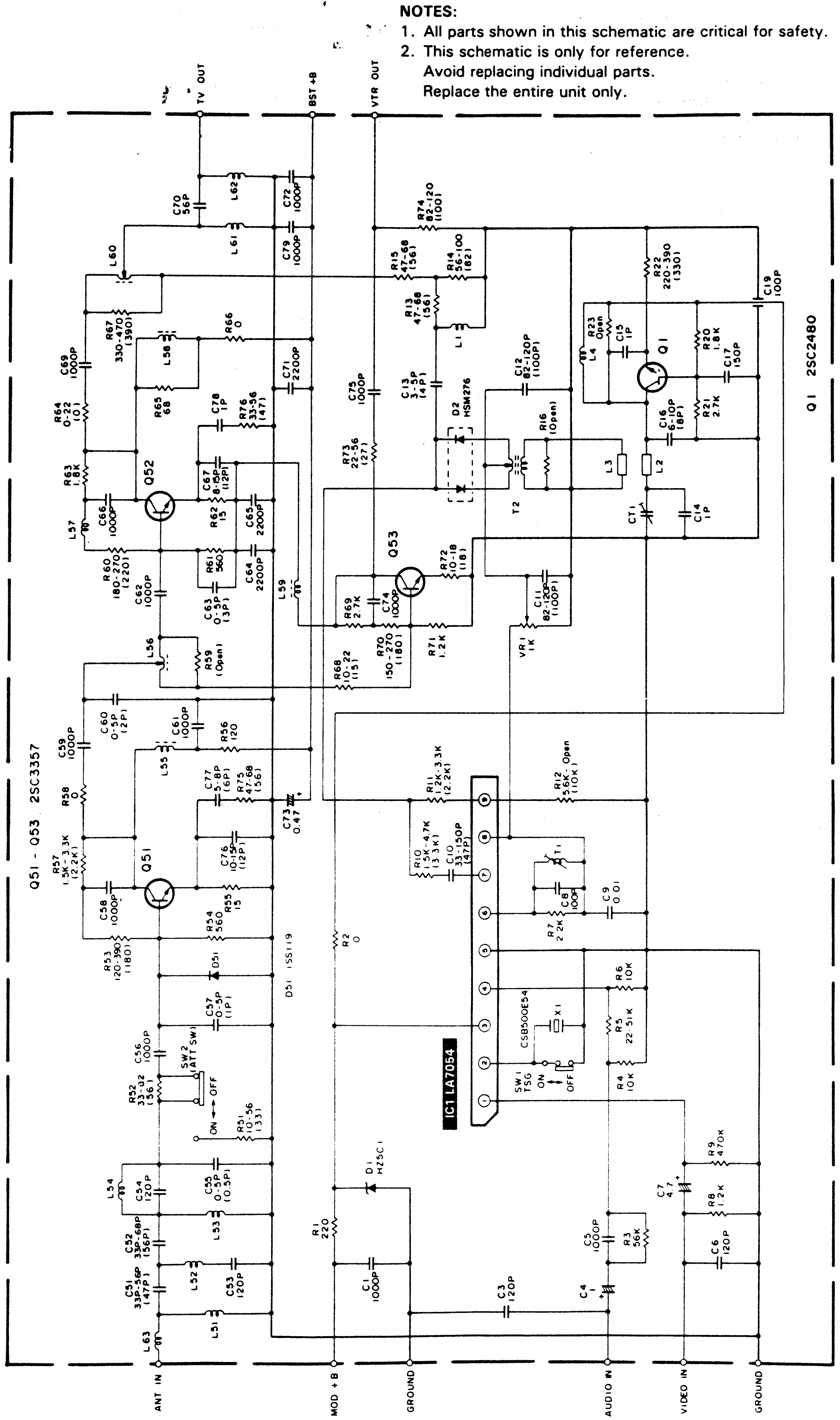

REMOTE CONTROLLER
LCD
IC1 M34201M4-119FP
Q1 2SB1188
Q2 2SD601
LED1, 2 SE303A
X1: 32.768KHz
CF1: 400KHz
SW1 RESET
TP1
C1 100/750
C7A 100/50
C8 0.01
R13 4.7
R4 470
R3 47
R11 4.7K
R1 120
R2 120
R6 100K
R7 1M
R8 47M
R9 100K
R10 5.6K
C2 2.2/50
C3 330P
C4 330P
C5 33P
C8A 15P
C7 0.1
VREF
A VDD
A VSS
NC
CN VSS
RESET
VDD
VSS
X OUT
X IN
GND
XC OUT
XC IN
IN 0
IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7
CARRIER
OUT 0
OUT 1
OUT 2
OUT 3
OUT 4
OUT 5
OUT 6
OUT 7
OUT 8
OUT 9
OPTION
SEG 0
SEG 1
SEG 2
SEG 3
SEG 4
SEG 5
SEG 6
SEG 7
SEG 8
SEG 9
SEG 10
SEG 11
SEG 12
SEG 13
SEG 14
SEG 15
COM 0
COM 1
COM 2
COM 3
K0
K1
K2
K3
SEG 16 … SEG 34
COM1
COM2
⊕
⊖
66

KEY NUMBER	FUNCTION
1	A/B CODE
2	CLOCK ADJ
3	1
4	6
5	SELECT
6	MARK
7	EDIT MODE
8	
9	
10	MEMORY PROGRAM
11	2
12	7
13	CH –/CURSOR←
14	START
15	STANDBY
16	
17	
18	MEMORY CANCEL
19	3
20	8
21	CH +/CURSOR→
22	INDEX/PAGE
23	ERASE
25	TRANSFER
26	PROGRAM/ACCESS
27	4
28	9
29	DISPLAY/ROTATE
30	GO-TO/TIMED PAGE
31	C. MEMORY
32	
33	TIMER
34	CANCEL/RESET
35	5
36	O/AUX
37	VPS/CH/REVEAL
38	INTORUCTION/PAGE+
39	AUDIO MONITOR/LARGE/NORMAL
40	
41	TV/VTR
42	RED
43	SP/LP
44	ON SCREEN
45	
46	
47	
48	
49	STOP/HOLD
50	EJECT
51	FF/BLUE
52	REW
53	REC
54	PLAY/OK/STORE
55	PAUSE/MIX
56	
57	SEARCH (–)
58	SEARCH (+)
59	AV
60	SOUND STOP
61	STANDBY
62	
63	SKIP/BLANK SEARCH
64	
65	MONITOR (TV/VIDEO)
66	OPERATE
67	TV CH (–)
68	TV CH (+)
69	TV VOL (+)
70	TV VOL (–)
71	TV OPERATE
72	
73	COLOR +
74	COLOR –
75	OMA
76	BRIGHT +
77	BRIGHT –
78	SOUND +
29	SOUND –

3.32 RF CONVERTER SCHEMATIC DIAGRAM

NOTES:

1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.


TV OUT
BST +8
VTR OUT
ANT IN
MOD + 8
GROUND
AUDIO IN
VIDEO IN
GROUND
IC1 LA7054
Q51 - Q53 2SC3357
Q1 2SC2480
Q51
Q52
Q53
D1 HZ5C1
D51 1SS119
D2 HSM276
SW1 TSG ON OFF
CSB500E54
X1
SW2 (ATT SW)
ON ←→ OFF
T1
T2
VR1 1K
CT1
L1
L2
L3
L4
L51
L52
L53
L54
L55
L56
L57
L58
L59
L60
L61
L62
L63
R1 220
R2 0
R3 56K
R4 10K
R5 22.51K
R6 10K
R7 2.2K
R8 1.2K
R9 470K
R10 1.5K-4.7K (3.3K)
R11 1.2K-3.3K (2.2K)
R12 5.6K Open (10K)
R13 47-68 (56)
R14 56-100 (82)
R15 47-68 (56)
R16 (Open)
R20 1.8K
R21 2.7K
R22 220-390 (330)
R23 Open
R51 10-56 (33)
R52 33-82 (56)
R53 120-390 (180)
R54 560
R55 15
R56 120
R57 1.5K-3.3K (2.2K)
R58 0
R59 (Open)
R60 180-270 (220)
R61 560
R62 15
R63 1.8K
R64 0-22 (10)
R65 68
R66 0
R67 330-470 (390)
R68 10-22 (15)
R69 2.7K
R70 150-270 (180)
R71 1.2K
R72 10-18 (18)
R73 22-56 (27)
R74 82-120 (100)
R75 47-68 (56)
R76 33-56 (47)
C1 1000P
C3 120P
C4 1
C5 1000P
C6 120P
C7 4.7
C8 100P
C9 0.01
C10 33-150P (47P)
C11 82-120P (100P)
C12 82-120P (100P)
C13 3-5P (4P)
C14 1P
C15 1P
C16 6-10P (8P)
C17 150P
C19 100P
C51 33P-56P (47P)
C52 33P-68P (56P)
C53 120P
C54 120P
C55 0-5P (0.5P)
C56 1000P
C57 0-5P (1P)
C58 1000P
C59 1000P
C60 0-5P (2P)
C61 1000P
C62 1000P
C63 0-5P (3P)
C64 2200P
C65 2200P
C66 1000P
C67 8-15P (12P)
C69 1000P
C70 56P
C71 2200P
C72 1000P
C73 0.47
C74 1000P
C75 1000P
C76 10-15P (12P)
C77 5-8P (6P)
C78 1P
C79 1000P

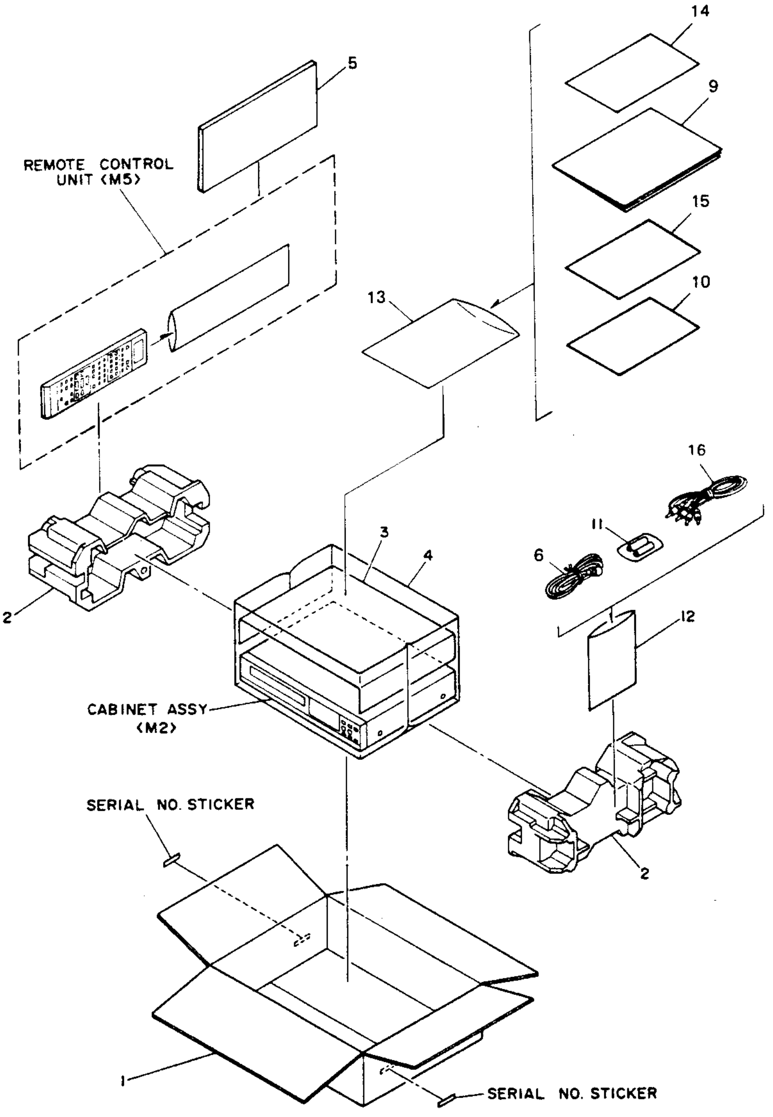
SECTION 4
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

NOTE: <M > indicates mechanical symbol number.

4.1 PACKING ASSEMBLY <M1>

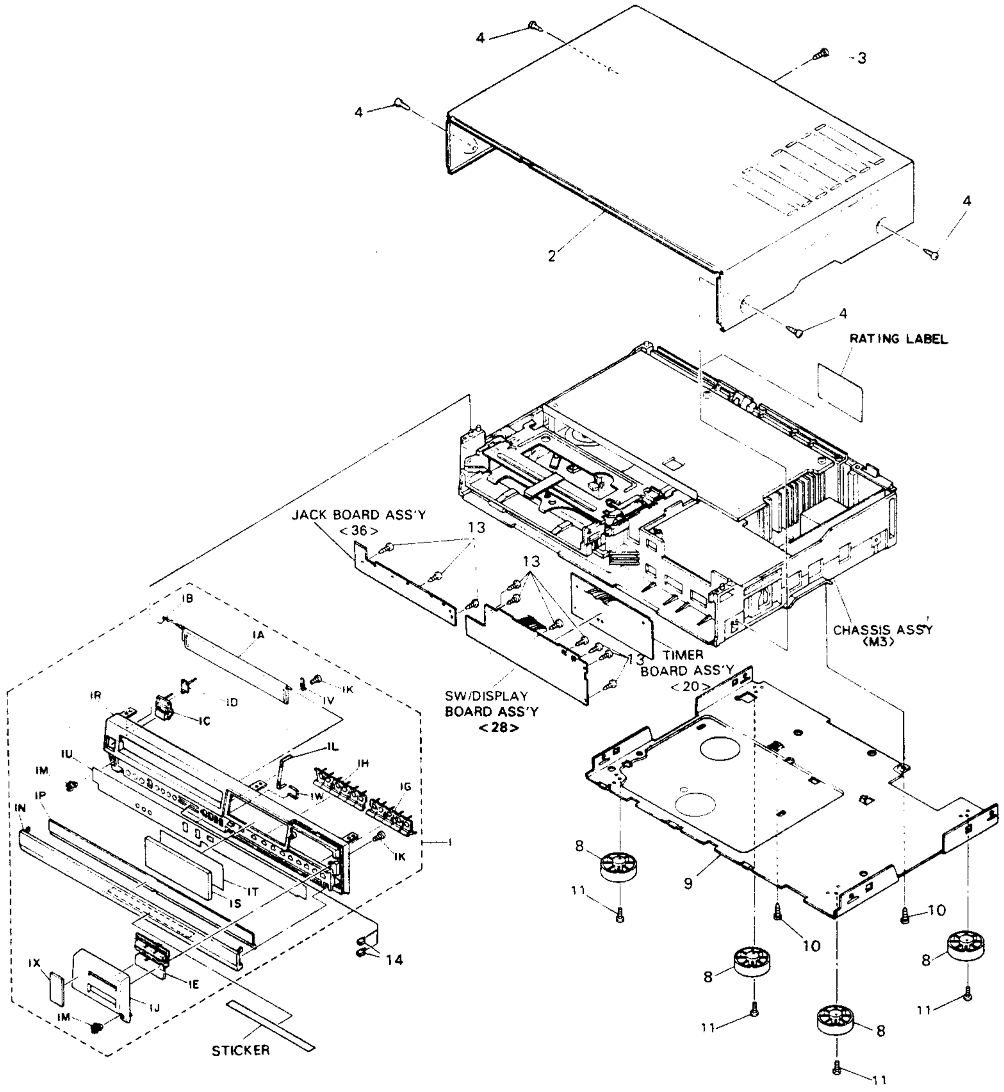

14
9
15
10
5
REMOTE CONTROL UNIT <M5>
13
16
11
6
3
4
12
2
CABINET ASSY <M2>
SERIAL NO. STICKER
2
1
SERIAL NO. STICKER

* *

PACKING ASSEMBLY <M1>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ32790-181	PACKING CASE,E
	1	PQ32790-185	PACKING CASE,EG
	2	PQ33275B	CUSHION ASSY
	3	PQ41026-20	PROTECT SHEET
	4	PQM30021-59-11	POLY BAG
	5	PQ42987-6	SHEET
	6	PU59168-3	RF CABLE
	or	PU59167-3	RF CABLE
⚠	9	PU30425-1144	INSTRUCTIONS,EG
⚠	9	PU30425-1149	INSTRUCTIONS,E
	10	TCN-3379	TAPE CATALOG
	11	UM-3DJ2P	BATTERY,X2
	12	QPGA020-02005	POLY BAG
	13	QPGA025-03505	POLY BAG
	14	BT-20114	WARRANTY CARD,EG
⚠	15	—	DBP INF SHEET,EG
	16	PU56142-3	PIN CORD ASSY
	or	PU56142-5	PIN CORD ASSY

4.2 CABINET ASSEMBLY <M2>


4
3
4
4
2
4
RATING LABEL
JACK BOARD ASS'Y
<36>
13
13
CHASSIS ASS'Y
<M3>
13
TIMER
BOARD ASS'Y
<20>
SW/DISPLAY
BOARD ASS'Y
<28>
1B
1A
1K
1R
1D
1C
1V
1L
1U
1H
1M
1P
1G
1N
1W
1
1K
1T
1S
14
1X
1E
1J
1M
STICKER
8
9
11
10
10
8
8
11
11
8
11

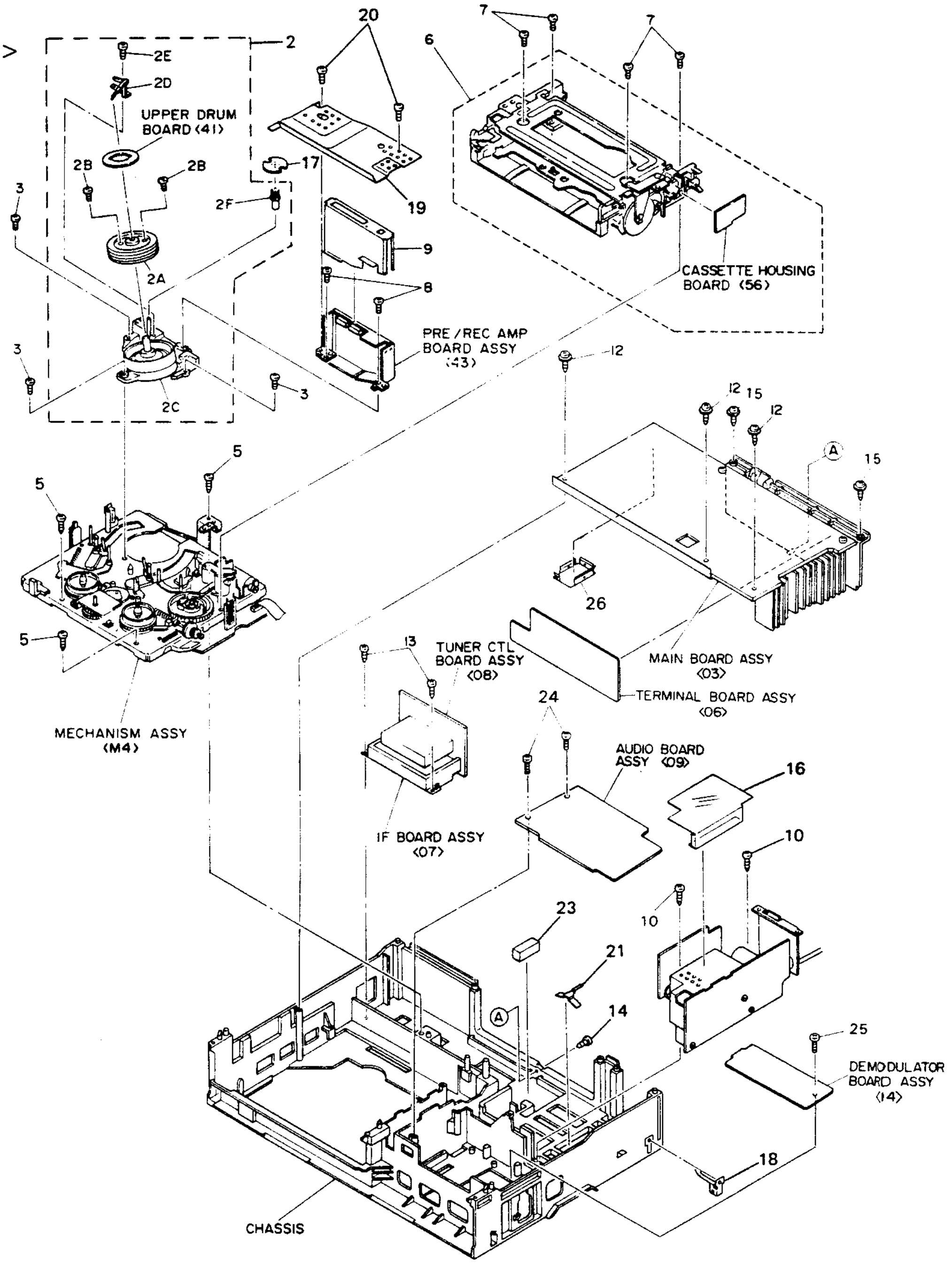
****

CABINET ASSEMBLY <M2>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ10874E-11	FRONT PANEL ASSY,EG
	1	PQ10874F	FRONT PANEL ASSY,E
	1A	PQ20858-5	CASSETTE HOUSING DOOR
	1B	PQ43628-1-1	TORSION SPRING
	1C	PQ32948-6	BUTTON(POWER),E
		PQ32948-4	BUTTON(POWER),EG
	1D	PQ32955	INDICATOR(POWER)
	1E	PQ20987-3-2	BUTTON(OP)
	1G	PQ20856-3-3	BUTTON(1),EG
		PQ20856-2-3	BUTTON(1),E
	1H	PQ20857-5	BUTTON(2),E
		PQ20857-3-2	BUTTON(2),EG
	1J	PQ20988-5	COVER(FRONT),E
		PQ20988-4	COVER(FRONT),EG
	1K	SDSF2005Z	SCREW,X2,FOR COVER/CASS DOOR
	1L	PQ32964	EARTH PLATE
	1M	PU60109	CATCHER,X2
	1N	PQ10879-6	DOOR,E
		PQ10879-5	DOOR,EG
	1P	PQ20855-4	PLATE(DOOR),EG
	1P	PQ20855-5	PLATE(DOOR),E
⚠	1R	PQ10875-7	FRONT PANEL,E
⚠		PQ10875-6	FRONT PANEL,EG
	1S	PQ32949-1-2	DISPLAY WINDOW
	1T	PQ32950-3	FILTER
	1U	PQ20859-6	PLATE(PLOG.),E
		PQ20859-4	PLATE(PLOG.),EG
	1V	PQ44389	BRACKET
	1W	PQ44563	BRACKET
	1X	PQ44586-3	WINDOW,E
		PQ44586-2	WINDOW,EG
⚠	2	PQ10602-14	TOP COVER
	3	SDSF3010M	SCREW,FOR TOP COVER
	4	PQ43827	SPECIAL SCREW,X4,FOR TOP COVER
	8	PQ43456B-1	FOOT ASSY,X4
⚠	9	PQ10712-1-3	BOTTOM COVER
	10	SDSF3012Z	SCREW,X2,FOR BOTTOM COVER
	11	SDSF3012Z	SCREW,X4,FOR FOOT
	13	SDSF2608Z	SCREW,X10
	14	PQ33137	KNOB(SLIDE),X2

4.3 CHASSIS ASSEMBLY <M3>

BEWARE OF BOGUS PARTS
Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.

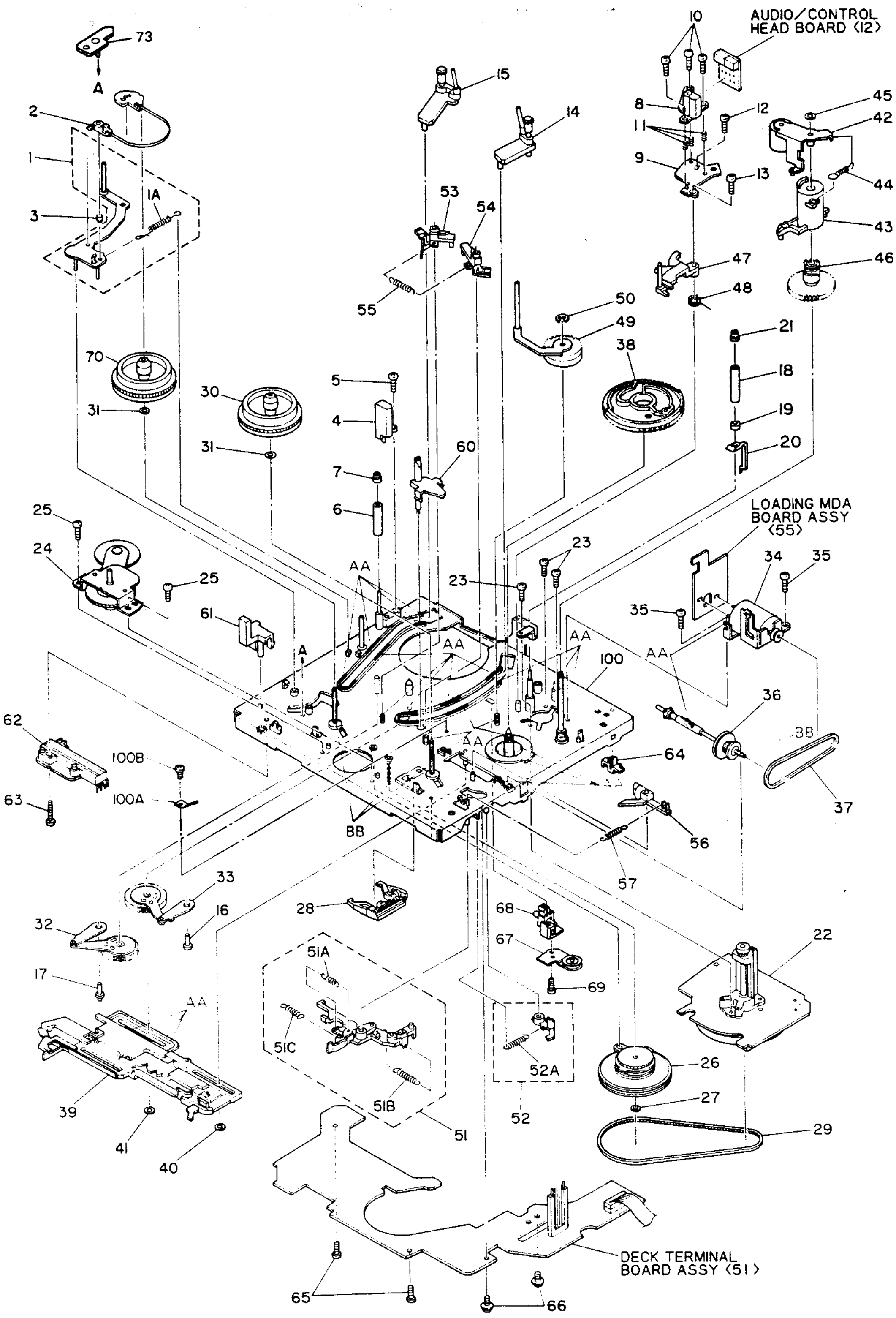


2
2E
2D
UPPER DRUM BOARD <41>
2B
2B
17
2F
3
2A
3
2C
3
20
19
9
8
PRE/REC AMP BOARD ASSY <43>
6
7
7
CASSETTE HOUSING BOARD <56>
12
12
15
12
Ⓐ
15
26
5
5
5
MECHANISM ASSY <M4>
13
TUNER CTL BOARD ASSY <08>
MAIN BOARD ASSY <03>
TERMINAL BOARD ASSY <06>
24
AUDIO BOARD ASSY <09>
16
IF BOARD ASSY <07>
10
23
10
21
Ⓐ
14
25
DEMODULATOR BOARD ASSY <14>
18
CHASSIS

CHASSIS ASSEMBLY <M3>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	2	PDV2211A	DRUM ASSEMBLY
	2A	PDM2112B	UPPER DRUM ASSY
	2B	PDM4165A	DRUM SCREW ASSY,X2
	2C	PDM2138M	LOWER DRUM MOTOR ASSY
	2D	PDM4229A-1	BRUSH ASSY
	2E	SDSG2606Z	SCREW
	2F	PDM4226A	ROLLER ASSY
	3	SPST2610Z	SCREW,X3,FOR DRUM
	5	PQ43831	SPECIAL SCREW,X3,FOR MAIN DECK
	6	PUS29183B-7	CASSETTE HOUSING ASSY
	7	SDST2608Z	SCREW,X4,FOR CASSETTE HOUSING
	8	SDSG2606Z	SCREW,X2,FOR PRE/REC
	9	PQ32217-1-1	SHIELD CASE(2),FOR PRE/REC
	10	PQ43831	SPECIAL SCREW,X2,FOR P.TRANS
	12	GPSF2610Z	SCREW,X3,FOR MAIN BOARD
	13	SDSF3008Z	SCREW,X2,FOR TUNER UNIT
	14	SDSF3010M	SCREW,FOR TEARMINAL BOARD
	15	GPSF2610Z	SCREW,X2,FOR TEARMINAL BOARD
⚠	16	PQ33536	AC COVER
	17	PQ44230	INERTIA PLATE
	18	PQ44679	EARTH PLATE
	19	PQ32387-1-4	DRUM SHIELD
	20	SDST2608Z	SCREW,X2,FOR DRUM SHIELD
	21	PQ43942	EARTH PLATE,EG
	23	PQM30029-127	SPACER,FOR CHASSIS
	24	SDSF2610Z	SCREW,X2,FOR FMA
	25	SDSF2610Z	SCREW,FOR DEMOD
	26	PQ42582	PRE AMP SHIELD2

4.4 MECHANISM ASSEMBLY <M4>



73
A
2
1
3
1A
15
14
10
AUDIO/CONTROL HEAD BOARD (12)
8
12
11
9
13
45
42
44
43
46
53
54
55
47
48
50
49
21
38
18
70
30
31
5
4
19
20
31
60
7
6
LOADING MDA BOARD ASSY (55)
25
24
25
23
23
34
35
35
AA
61
A
AA
AA
100
AA
36
62
100B
BB
64
63
100A
37
BB
AA
56
57
33
28
68
22
32
16
67
51A
69
17
AA
51C
52A
26
39
51B
51
52
27
29
41
40
DECK TERMINAL BOARD ASSY (51)
65
66

Category	Part number	MARK
Grease	KANTO-G-31KAV	AA
Oil	COSMO-HV56	BB

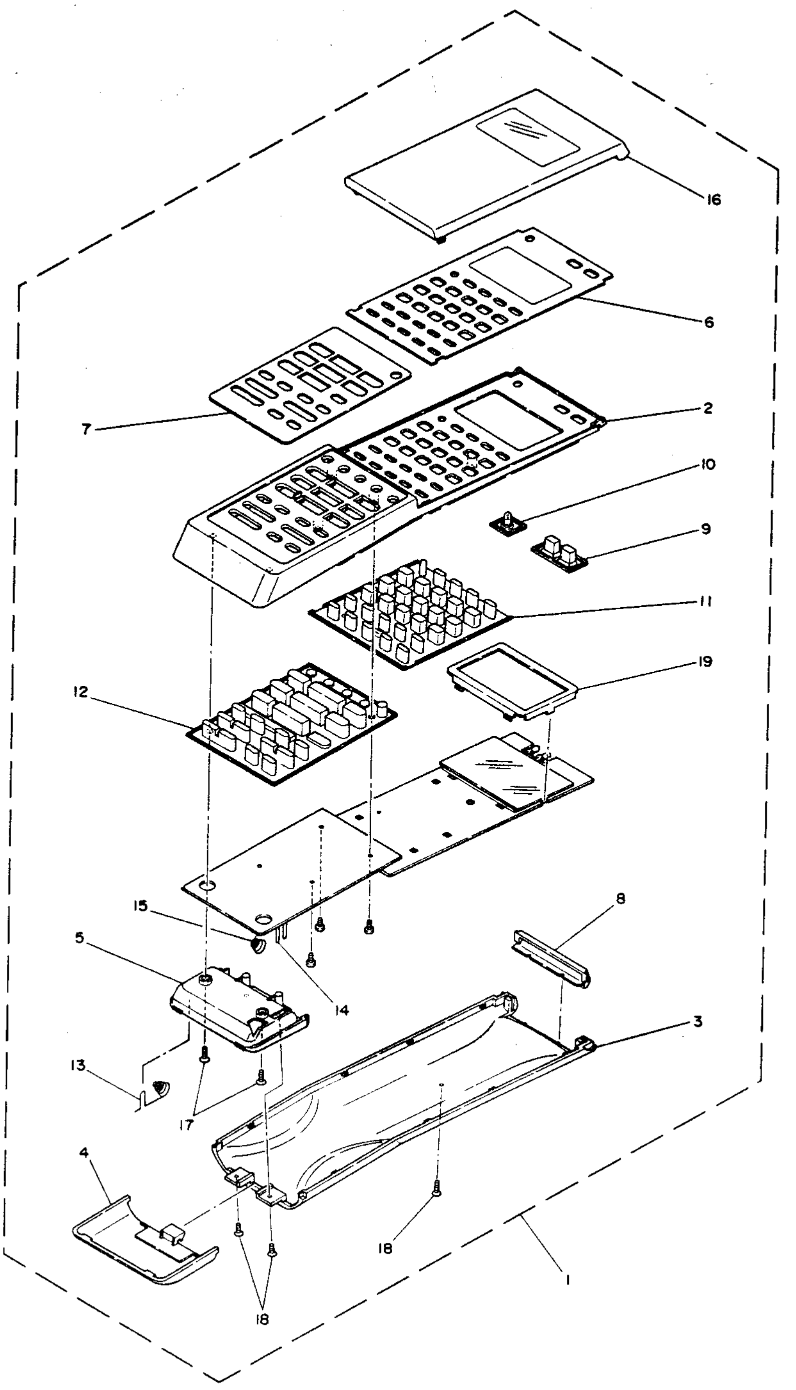
NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

* *

MECHANISM ASSEMBLY <M4>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ43497E-8	TENSION ARM ASSY
	1A	PQ43500	TENSION SPRING
	2	PQ43501B	TENSION BAND ASSY
	3	PQ43503-1-4	ADJUST PIN
	4	PU60616	FULL ERASE HEAD
	5	SDSF2614Z	SCREW
	6	PQ43505-1-1	ROLLER
	7	PQ43506	GUIDE POLE CAP
	8	PU60617	AUDIO/CONTROL HEAD
	9	PQ43509	HEAD BASE
	10	PQ43687A	SPECIAL SCREW,X3
	11	PQM30002-192	COMPRESSION SPRING,X3
	12	SPSP2606Z	SCREW
	13	SPSF2608M	SCREW
	14	PU61103-2	POLE BASE ASSY(TU)
	15	PU61151-2	POLE BASE ASSY(SUPPLY)
	16	PQ43524	STOPPER
	17	PQ43525	STOPPER 2
	18	PQ43526-1-3	TAPE GUIDE
	19	PQ43670-1-1	GUIDE FLANGE
	20	PQ43675	TAPE GUARD
	21	PQ43506	GUIDE POLE CAP
⚠	22	PU61003	CAPSTAN MOTOR
	23	SPSG2608Z	SCREW,X3
	24	PU61004-1-3	IDLER GEAR UNIT
	25	SPST2606Z	SCREW,X2
	26	PU61005-1-4	CLUTCH UNIT
	27	PQM30017-8	SLIT WASHER
	28	PQ43532A-1	CHANGE LEVER ASSY
	29	PU61006	TIMING BELT
	30	PU60858	REEL DISK (TAKE-UP)
	31	PQM30018-54	SPACER,X2
	32	PQ43537A	LOADING ARM ASSY (SUPLLY)
	33	PQ43542B	LOADING ARM ASSY (TAKE-UP)
	34	PQ43676B-5	MODE MOTOR ASSY
		or PQ43676C	MODE MOTOR ASSY
	35	SPST2606Z	SCREW,X2
	36	PQ43548A-3	WORM CLUTCH ASSY
	37	PQM30003-23	BELT(LOADING)
	38	PQ20822-2-4	CONTROL CAM
	39	PQ44326A-3	PLATE ASSY
	40	PQM30017-12	SLIT WASHER
	41	PQM30017-8	SLIT WASHER
	42	PQ43921B	PINCH ROLLER ARM ASSY
		or PQ43921D	PINCH ROLLER ARM ASSY
	43	PQ32415	PINCH ROLLER PRESS LEVER
	44	PQM30001-233	TENSION SPRING
	45	PQM30017-12	SLIT WASHER
	46	PQ32416-2	PINCH ROLLER CAM
	47	PQ43567A-8	GUIDE ARM ASSY
	48	PQ43569-1-3	TORSION SPRING
	49	PQ43570A	HALF LOADING GEAR ASSY
	50	PQM30017-12	SLIT WASHER
	51	PQ43575A-5	C.LEVER ASSY
	51A	PQM30001-273	T.SPRING
	51B	PQM30001-237	TENSION SPRING
	51C	PQM30001-274	T.SPRING
	52	PQ43578A-2	HOOK ASSY
	52A	PQM30001-238	TENSION SPRING
	53	PQ43581A-6	MAIN BRAKE ASSY (SUPPLY)
	54	PQ43582A-2	MAIN BRAKE ASSY (TAKE-UP)
	55	PQM30001-251	TENSION SPRING
	56	PQ43583A	SUB BRAKE ASSY (TAKE-UP)
	57	PQM30001-298	TENSION SPRING
	60	PU60621-1-2	LED HOLDER(INC D1)
	61	PU60624-1-4	REC SAFETY SWITCH(S2)
	62	PU60973	SLIDE SWITCH(S3)
	63	SDSF2614Z	SCREW
	64	PQ32516	PWB HOLDER
	65	SDST2616Z	SCREW,X2
	66	GPSF2608Z	SCREW,X2
	67	PQ43912A-4	PULLEY ARM ASSY
	68	PQ32882	PULLEY BASE
	69	SDSF2608Z	SCREW
	70	PU60859	REEL DISK (SUPPLY)
	73	PQ44246	TENSION BRACKET 3
	100	PQ20650E-18	MAIN DECK ASSY
		or PQ20753D	MAIN DECK ASSY
	100A	PQ43849	EARTH PLATE
	100B	SPST2604Z	SCREW

4.5 REMOTE CONTROL UNIT <M5>



REMOTE CONTROLLER <M5>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	1	PQ10779BA-28	REMOTE CONTROLLER,EG
⚠	1	PQ10779BD	REMOTE CONTROLLER,E
	2	PQ20751	UPPER CASE
	3	PQ20752	LOWER CASE
	4	PQ32715	BATTERY CAP
	5	PQ32758	BATTERY CASE
	6	PQ32718-30	TOP PANEL(1),EG
	6	PQ32718-32	TOP PANEL(1),E
	7	PQ32719-41	TOP PANEL(2),EG
	7	PQ32719-44	TOP PANEL(2),E
	8	PQ43800	IR WINDOW
	9	PQ32720	BUTTON(1)
	10	PQ43802	BUTTON(2)
	11	PQ32721-14	BUTTON(3)
	12	PQ32722-29	BUTTON(4),EG
	12	PQ32722-25	BUTTON(4),E
	13	PQ43803	TERMINAL(A)
	14	PQ43843	TERMINAL(B)
	15	PQ43844	TERMINAL(C)
	16	PQ32901N	DOOR ASSY,E
	16	PQ32901L	DOOR ASSY,EG
	17	SSSF2006M	SCREW,X2
	18	SSSF2010M	SCREW,X3
	19	PQ43845	HOLDER(LCD)

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

POWER TRANSFORMER BOARD ASSEMBLY <01>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB20439E	POWER SUPPLY BOARD ASSEMBLY
⚠	BKT1	PQ20971-2	TRANS BRACKET
⚠	POC1	QMP3980-200	POWER CORD
⚠	HD1	QHS3771-108	STRAIN RELIEF
	SCW1	SDST3006Z	SCREW,X4
	SLD1	PQ33261-1-1	SHIELD CASE (1)
	SLD2	PQ33262	SHIELD CASE (2)

—SWITCH REGULATOR BOARD ASSEMBLY <01>—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA1	PB20439E1	SW.REG BOARD ASSEMBLY	
	IC1	LM358N	IC	
		or BA10358	IC	
		or LM358P	IC	
	Q1	2SC4517A	TRANSISTOR	
	Q2	2SC3616(MLK)	TRANSISTOR	
	Q5	2SB941P	TRANSISTOR	
		or 2SA1488	TRANSISTOR	
	Q6	2SA720	TRANSISTOR	
	D1	10E6-F2	DIODE	
	D2	10E6-F2	DIODE	
	D3	10E6-F2	DIODE	
	D4	10E6-F2	DIODE	
	D5	AU01	FR DIODE	
	D6	AU01	FR DIODE	
	D7	MTZ27BT-77	ZENER DIODE	
	D8	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D14	AU01Z	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
		or ERA48-02	FR DIODE	
	D15	11EFS2	FR DIODE	
	D16	FML-12S	FR DIODE	
		or F6P20F	FR DIODE	
	D17	FMB-24	BARRIER DIODE	
		or F5KQ40B	BARRIER DIODE	
	D18	AU01Z	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
		or ERA48-02	FR DIODE	
	D19	MTZ30AT-77	ZENER DIODE	
	D20	RD8.2ES-T1B1	ZENER DIODE	
		or UZ8.2BSA	ZENER DIODE	
	D21	AK04	DIODE	
	D22	MTZV6.2A	ZENER DIODE	
	D23	AK04	DIODE	
	D29	RD15ES-T1B1	ZENER DIODE	
	R1	QRZ0078-2R2	W.W.RESISTOR	2.2Ω,2W
	R2	QRD161J-334	RESISTOR	330kΩ,1/6W
	R3	QRD161J-334	RESISTOR	330kΩ,1/6W
	R4	QRD161J-563	RESISTOR	56kΩ,1/6W
	R5	QRG029J-683G	OMF RESISTOR	68kΩ,2W
	R6	QRG029J-241G	OMF RESISTOR	240Ω,2W
	R7	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R8	QRD161J-471	RESISTOR	470Ω,1/6W
	R9	QRX014J-R33	MF RESISTOR	0.33Ω,1W
	R10	QRG029J-303A	OMF RESISTOR	30kΩ,2W
	R17	QRD161J-221	RESISTOR	220Ω,1/6W
	R18	QRD161J-102	RESISTOR	1kΩ,1/6W
	R19	QRV144F-1071AY	CMF RESISTOR	1070Ω,1/4W
	R20	QRV144F-1001AY	CMF RESISTOR	1kΩ,1/4W
⚠	R21	QRZ0077-470X	FUSIBLE RESISTOR	47Ω,1/4W
	R22	QRD161J-333	RESISTOR	33kΩ,1/6W
	R23	QRD161J-471	RESISTOR	470Ω,1/6W
	R24	QRV144F-4023AY	RESISTOR	402kΩ,1/4W
	R25	QRV144F-1002AY	CMF RESISTOR	10kΩ,1/4W
	R26	QRV144F-1182AY	CMF RESISTOR	11.8kΩ,1/4W
	R28	QRD161J-331	RESISTOR	330Ω,1/6W
	R29	QRD161J-103	RESISTOR	10kΩ,1/6W
	R30	QRD161J-222	RESISTOR	2.2kΩ,1/6W
⚠	C1	QFZ9022-333	MM CAPACITOR	0.033μF
⚠	C2	QFZ9022-333	MM CAPACITOR	0.033μF
⚠	C3	QFZ9022-333	MM CAPACITOR	0.033μF
⚠	C6	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C7	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C8	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C9	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C10	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C11	QCZ9016-222M	CAPACITOR	0.0022μF,250V
	C12	QEZ0147-107	E CAPACITOR	100μF,400V
		or QEZ0111-107	E CAPACITOR	100μF,400V
		or QEZ0170-107	E CAPACITOR	100μF,400V
	C13	QCY53AK-472	CAPACITOR	0.0047μF,1kV
		or QCZ0212-472	CAPACITOR	0.0047μF
	C14	QCZ0212-101	CAPACITOR	100pF
	C15	QFV41HJ-124	TF CAPACITOR	0.12μF,50V
		or QFV11HJ-124	MMT CAP	0.12μF,50V
	C16	QFL41HJ-682	M CAPACITOR	0.0068μF,50V
	C17	QETC1HM-475	E CAPACITOR	4.7μF,50V
	C18	QETC1JM-336	E CAPACITOR	33μF,63V
	C19	QEZ0125-477	E CAPACITOR	470μF,25V
		or QEZ0138-477	E CAPACITOR	470μF,25V
	C20	QETC1EM-337	E CAPACITOR	330μF,25V
	C21	QEMB1CM-158	E CAPACITOR	1500μF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C22	QETB1CM-108	E CAPACITOR	1000μF,16V
	C23	QFL41HJ-102	M CAPACITOR	0.001μF,50V
	C24	QEZ0136-228	E CAPACITOR	2200μF,10V
		or QEZ0106-228	E CAPACITOR	2200μF,10V
	C25	QETC1HM-476	E CAPACITOR	47μF,50V
	C26	QETC1VM-336	E CAPACITOR	33μF,35V
	C27	QFL41HJ-103	M CAPACITOR	0.01μF,50V
	C28	QEZ0156-127Z	E CAPACITOR	120μF
		or QEZ0135-127Z	E CAPACITOR	120μF,6.3V
	C29	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C30	QFL41HJ-103	M CAPACITOR	0.01μF,50V
	C33	QETC1VM-226	E CAPACITOR	22μF,35V
	C50	QFL41HJ-122	M CAPACITOR	0.0012μF,50V
⚠	C52	QCZ9016-101K	CAPACITOR	100pF,400V
⚠	C53	QCZ9016-101K	CAPACITOR	100pF,400V
	L1	PU60943-330K	COIL	33μH
	L2	PU60943-100M	COIL	10μH
	L3	PU60943-330K	COIL	33μH
	L4	PU48530-100K	COIL	10μH
⚠	PHS1	PC111S	PHOTO COUPLER	
⚠	T1	PELN0301	SWITCHING TRANS	
⚠	HD1	PU57505	FUSE CLIP,X2	
	HS1	PQ44610	HEAT SINK,FOR Q1	
⚠	HS2	PQ44724	HEAT SINK,FOR D16,D17	
⚠	LF1	PU61108	LINE FILTER	
⚠		or PU60347	LINE FILTER	
⚠	LF2	PU59707	LINE FILTER	
⚠		or PELN0255	LINE FILTER	
	SCW1	SDSG3008Z	SCREW,X2	
	SCW2	SDSG3008Z	SCREW,X2,FOR D16,D17	
⚠	SCW3	SDSG3006Z	SCREW,FOR HEAT SINK	
⚠	SLD1	PQ44698	INSULATOR	
	SPC1	PU57215-2	SPACER	
	CN1	PU58844-107	CAP HOUSING	
	CN2	PU58844-9	CAP HOUSING	
⚠	CP1	ICP-N5	CIRCUIT PROTECTOR	
⚠	CP2	ICP-N20	CIRCUIT PROTECTOR	
⚠	F1	QMF51E2-1R0	FUSE	
⚠		or QMF51E2-1R0J1	FUSE	

—REGULATOR BOARD ASSEMBLY <02>—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA2	PB20439E2	REGULATOR BOARD ASSEMBLY	
	IC2	UPC24M05HF	IC	
	Q7	2SB1425(EU)	TRANSISTOR	
	Q8	2SC1740S	TRANSISTOR	
	Q9	2SB941P	TRANSISTOR	
		or 2SA1488	TRANSISTOR	
	Q10	2SC1740S(Q)	TRANSISTOR	
	Q11	2SC1740S	TRANSISTOR	
	Q12	2SA933S	TRANSISTOR	
		or 2SA1267(YG)-TJK	TRANSISTOR	
	Q13	DTB114ES	TRANSISTOR	
	D25	1SS133	DIODE	
		or MA165	DIODE	
	D26	UZ5.1BSC	ZENER DIODE	
		or RD5.1ES-T1B3	ZENER DIODE	
		or MTZV5.1C	ZENER DIODE	
	D27	1SS133	DIODE	
		or MA165	DIODE	
	R31	QRD161J-102	RESISTOR	1kΩ,1/6W
	R32	QRD161J-103	RESISTOR	10kΩ,1/6W
	R33	QRD161J-221	RESISTOR	220Ω,1/6W
	R34	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R35	QRD161J-471	RESISTOR	470Ω,1/6W
	R36	QRD161J-103	RESISTOR	10kΩ,1/6W
	R37	QVZ3518-471AZ	V RESISTOR,5V DC	
		or QVZ3523-471AZ	V RESISTOR,5V DC	
	R38	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R39	QRD161J-102	RESISTOR	1kΩ,1/6W
	R40	QRD161J-103	RESISTOR	10kΩ,1/6W
⚠	R41	QRZ0077-220X	FUSIBLE RESISTOR	22Ω
	R50	QRD161J-102	RESISTOR	1kΩ,1/6W
	R51	QRD161J-102	RESISTOR	1kΩ,1/6W
	R52	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	C34	QETC1JM-226	E CAPACITOR	22μF,63V
	C35	QETC1CM-107	E CAPACITOR	100μF,16V
	C36	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C37	QETC1CM-107	E CAPACITOR	100μF,16V
	C38	QETC1AM-107	E CAPACITOR	100μF,10V
	C39	QETB1AM-228	E CAPACITOR	2200μF,10V
	C40	QFL41HJ-103	MY CAPACITOR	0.01μF,50V
	C41	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C43	QFL41HJ-103	MY CAPACITOR	0.01μF,50V
	C44	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C51	QETC1CM-476	E CAPACITOR	47μF,16V
	TP1,2,3	PU54983	TEST PIN,X2	
	CN3	PU58844-109	CAP HOUSING	
	CN4	PU60910-112	CAP HOUSING	
⚠	CP3	ICP-N20	CIRCUIT PROTECTOR	
⚠	CP4	ICP-N38	CIRCUIT PROTECTOR	
⚠	CP5	ICP-N38	CIRCUIT PROTECTOR	

—OUTLET BOARD ASSEMBLY—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA3	PB20439E3	OUTLET BOARD ASSEMBLY
	D28	1SS133	DIODE
		or MA165	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	RY1	PESW0555	RELAY
⚠	AO1	QMC9021-001	AC OUTLET
⚠	HD1	PU57505	FUSE CLIP,X2
⚠	TAB1	A74316	TAB
	CN8	PU58844-102	CAP HOUSING
⚠	F2	QMF51E2-2R0	FUSE
⚠		or QMF51E2-2R0J1	FUSE

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MAIN BOARD ASSEMBLY <03><06>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10397A-01	MAIN BOARD ASSEMBLY,EG
		PB10397B-01	MAIN BOARD ASSEMBLY,E
⚠	RF1	PU59980M-6	RF CONVERTER/MIX BOOSTER
	BKT1	PQ32369	BRACKET
	CL1	PU56729-2	WIRE CLAMP
	CL3	PU59311-4	WIRE CLAMP, X2
	ETH1	PQ43012-1-1	EARTH PLATE
	RV1	PU56800	NYLON RIVET
	SCW1	SDST2605Z	SCREW
	SCW2	SDSF2608Z	SCREW, X2
	SPC1	PU60010	SPACER, X2
⚠	TB1	PQ20996	TERMINAL BOARD,EG
⚠		PQ20996-2	TERMINAL BOARD,E
	WR1	PW30401-BB19T	COAXIAL CORD
	WR2	or PW30401-BB19S	COAXIAL CORD
	WR3	or PW30402-BB19M	COAXIAL CORD
	J701	PU60612	REMOTE PAUSE JACK
		or PU61012	REMOTE PAUSE JACK
	TP205	PU57545	TEST PIN, X10

—VIDEO SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	Q201	DTC114WS	TRANSISTOR	
	Q202	DTC144WS	TRANSISTOR	
	Q203	2SA933S(RS)	TRANSISTOR	
		or 2SA1267(YG)-TJK	TRANSISTOR	
	Q204	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q205	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q206	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q207	2SA933S(RS)	TRANSISTOR	
		or 2SA1267(YG)-TJK	TRANSISTOR	
	Q208	2SA933S(RS)	TRANSISTOR	
		or 2SA1267(YG)-TJK	TRANSISTOR	
	Q209	DTA114ES	TRANSISTOR	
	Q210	2SA854S(QR)	TRANSISTOR	
	Q308	DTA124ES	TRANSISTOR	
	Q309	DTC114WS	TRANSISTOR	
	Q351	2SA933S(RS)	TRANSISTOR	
		or 2SA1267(YG)-TJK	TRANSISTOR	
	D201	1SS133	DIODE	
		or MA165	DIODE	
	D202	1SS133	DIODE	
		or MA165	DIODE	
	D204	1SS133	DIODE	
		or MA165	DIODE	
	D205	1SS133	DIODE	
		or MA165	DIODE	
	D206	1SS133	DIODE	
		or MA165	DIODE	
	D207	1SS133	DIODE	
		or MA165	DIODE	
	D210	1SS133	DIODE	
		or MA165	DIODE	
	D212	1SS133	DIODE	
		or MA165	DIODE	
	D213	1SS133	DIODE	
		or MA165	DIODE	
	D304	1SS133	DIODE	
		or MA165	DIODE	
	D306	1SS133	DIODE	
		or MA165	DIODE	
	D341	1SS133	DIODE	
		or MA165	DIODE	
	D342	1SS133	DIODE	
		or MA165	DIODE	
	D343	1SS133	DIODE	
		or MA165	DIODE	
	R201	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R202	QRD162J-103	RESISTOR	10kΩ,1/6W
	R205	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R206	QRD161J-562	RESISTOR	5.6kΩ,1/6W
	R207	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R208	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R209	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R210	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R211	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R212	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R213	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R214	QRD161J-331	RESISTOR	330Ω,1/6W
	R215	QRD161J-561	RESISTOR	560Ω,1/6W
	R216	QRD161J-471	RESISTOR	470Ω,1/6W
	R217	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R218	QRD161J-153	RESISTOR	15kΩ,1/6W
	R219	QRD161J-103	RESISTOR	10kΩ,1/6W
	R220	QVZ3518-681AZ	V RESISTOR,SP REC COLOR	
		or QVZ3523-681AZ	V RESISTOR,SP REC COLOR	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R221	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R222	QRD161J-333	RESISTOR	33kΩ,1/6W
	R223	QRD161J-153	RESISTOR	15kΩ,1/6W
	R224	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R225	QRD161J-561	RESISTOR	560Ω,1/6W
	R226	QVZ3518-332AZ	V RESISTOR,SP FREQ	
		or QVZ3523-332AZ	V RESISTOR,SP FREQ	
	R227	QRD161J-101	RESISTOR	100Ω,1/6W
	R228	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R229	QRD161J-123	RESISTOR	12kΩ,1/6W
	R230	QRD161J-103	RESISTOR	10kΩ,1/6W
	R231	QRD123J-391SX	RESISTOR	390Ω,1/2W
	R232	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R233	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R234	QRD161J-101	RESISTOR	100Ω,1/6W
	R235	QRD161J-102	RESISTOR	1kΩ,1/6W
	R236	QRD161J-102	RESISTOR	1kΩ,1/6W
	R237	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R238	QRD161J-750	RESISTOR	75Ω,1/6W
	R239	QRD161J-750	RESISTOR	75Ω,1/6W
	R240	QRD161J-102	RESISTOR	1kΩ,1/6W
	R243	QRD161J-103	RESISTOR	10kΩ,1/6W
	R244	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R245	QRD161J-681	RESISTOR	680Ω,1/6W
	R250	QRD161J-471	RESISTOR	470Ω,1/6W
	R316	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R351	QRD161J-272	RESISTOR	2.7kΩ,1/6W
	C201	QEN61AM-226	NP E CAPACITOR	22μF,10V
		or QENC1AM-226	NP E CAPACITOR	22μF,10V
	C202	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C203	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C204	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C205	QCBB1HJ-121	CAPACITOR	120pF,50V
	C206	QCBB1HJ-121	CAPACITOR	120pF,50V
	C207	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C208	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C209	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C210	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C211	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C212	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C213	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C214	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C215	QCSB1HJ-390	CAPACITOR	39pF,50V
	C216	QETC1CM-476	E CAPACITOR	47μF,16V
	C217	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C218	QETC0JM-477	E CAPACITOR	470μF,6.3V
	C219	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C220	QCC31CJ-473	CAPACITOR	0.047μF,16V
	C221	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C222	QETC1HM-105	E CAPACITOR	1μF,50V
	C224	QCBB1HJ-681	CAPACITOR	680pF,50V
	C225	QCFB1EZ-223	CAPACITOR	0.022μF,25V
	C230	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C240	QCC31CJ-333	CAPACITOR	0.033μF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C250	QCSB1HJ-560	CAPACITOR, EG	56pF,50V
	C302	QCSB1HJ-180	CAPACITOR	18pF,50V
	C341	QCC31CJ-682	CAPACITOR	0.0068μF,16V
	C351	QCVB1CN-103	CAPACITOR	0.01μF,16V
	L201	PU59152-221J	COIL	220μH
	L202	PU59152-560J	COIL	56μH
	L203	PU48530-101K	COIL	100μH
	L204	PU48530-101K	COIL	100μH
	L205	PU59152-180J	COIL	18μH
	L206	PU48530-101K	COIL	100μH
	L207	PU54710-222	COIL	2.2mH
	L208	PU59152-R22J	COIL	0.22μH
	L305	PU59152-270J	COIL	27μH
	L341	PU48530-821J	COIL	820μH
	EQ201	PU54838	EQUALIZER	
		or PU60714	EQUALIZER	
	CN204	PU58844-6	CAP HOUSING	
	CN205	PU59555-6	CAP HOUSING	
	CN701	PU58844-6	CAP HOUSING	

—SERVO SECTION—

	IC401	HD49733NT	IC	
		or HD49733ANT	IC	
	IC501	BA7039	IC	
	Q402	2SA1309(QRS)	TRANSISTOR	
		or 2SA1267(YG)-TJK	TRANSISTOR	
		or 2SA933S(QRS)	TRANSISTOR	
	D401	1SS133	DIODE	
		or MA165	DIODE	
	D402	1SS133	DIODE	
		or MA165	DIODE	
	D403	1SS133	DIODE	
		or MA165	DIODE	
	D404	1SS133	DIODE	
		or MA165	DIODE	
	D407	1SS133	DIODE	
		or MA165	DIODE	
	D408	1SS133	DIODE	
		or MA165	DIODE	
	D409	1SS133	DIODE	
		or MA165	DIODE	
	D410	1SS133	DIODE	
		or MA165	DIODE	
	R401	QRD161J-223	RESISTOR	22kΩ,1/6W
	R402	QRD161J-225	RESISTOR	2.2MΩ,1/6W
	R403	QRD161J-683	RESISTOR	68kΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R404	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R405	QRD161J-123	RESISTOR	12kΩ,1/6W
	R406	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R407	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R408	QRD161J-105	RESISTOR	1MΩ,1/6W
	R409	QRD161J-273	RESISTOR	27kΩ,1/6W
	R411	QRD161J-105	RESISTOR	1MΩ,1/6W
	R412	QRD161J-273	RESISTOR	27kΩ,1/6W
	R413	QRD161J-273	RESISTOR	27kΩ,1/6W
	R414	QRD161J-335	RESISTOR	3.3MΩ,1/6W
	R415	QRD161J-334	RESISTOR	330kΩ,1/6W
	R416	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R418	QRD161J-102	RESISTOR	1kΩ,1/6W
	R419	QRD161J-473	RESISTOR	47kΩ,1/6W
	R420	QVZ3518-684	V RESISTOR,SP SW POINT ADJ	
	R422	QRD161J-104	RESISTOR	100kΩ,1/6W
	R426	QRD161J-821	RESISTOR	820Ω,1/6W
	R427	QRD161J-102	RESISTOR	1kΩ,1/6W
	R428	QRD161J-105	RESISTOR	1MΩ,1/6W
	R429	QRD161J-102	RESISTOR	1kΩ,1/6W
	R430	QRD161J-102	RESISTOR	1kΩ,1/6W
	R434	QRD161J-102	RESISTOR	1kΩ,1/6W
	R435	QRD161J-102	RESISTOR	1kΩ,1/6W
	R436	QRD161J-274	RESISTOR	270kΩ,1/6W
	R437	QRD161J-274	RESISTOR	270kΩ,1/6W
	R438	QRD161J-224	RESISTOR	220kΩ,1/6W
	R439	QRD161J-103	RESISTOR	10kΩ,1/6W
	R440	QRD161J-474	RESISTOR	470kΩ,1/6W
	R441	QRD161J-823	RESISTOR	82kΩ,1/6W
	R501	QRD161J-102	RESISTOR	1kΩ,1/6W
	R502	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R503	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R505	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R506	QRD161J-102	RESISTOR	1kΩ,1/6W
	R508	QRD161J-124	RESISTOR	120kΩ,1/6W
	C401	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C402	QEK61AM-226	E CAPACITOR	22μF,10V
	C403	QFV11HJ-224	TF CAPACITOR	0.22μF,50V
	C404	QCC31CK-682	CAPACITOR	0.0068μF,16V
	C405	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C406	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C407	QEK61CM-106	E CAPACITOR	10μF,16V
	C408	QEK61CM-106	E CAPACITOR	10μF,16V
	C409	QCC31CK-223	CAPACITOR	0.022μF,16V
	C410	QFV71HJ-184	TF CAPACITOR	0.18μF,50V
	or	QFV11HJ-184	MMT CAP	0.18μF,50V
	C411	QCBB1HJ-471	CAPACITOR	470pF,50V
	C412	QFL31HJ-682	M CAPACITOR	0.0068μF,50V
	or	QFN31HJ-682	M CAPACITOR	0.0068μF,50V
	C414	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C415	QEK61AM-226	E CAPACITOR	22μF,10V
	C416	QEK61AM-226	E CAPACITOR	22μF,10V
	C417	QCBB1HJ-271	CAPACITOR	270pF,50V
	C418	QCBB1HJ-561	CAPACITOR	560pF,50V
	C419	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C420	QEK61HM-105	E CAPACITOR	1μF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C421	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C422	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
	or	QFV11HJ-563	MMT CAP	0.056μF,50V
	C423	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C427	QCBB1HJ-181	CAPACITOR	180pF,50V
	C501	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C502	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C503	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C504	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
	or	QFV11HJ-104	MM CAPACITOR	0.1μF,50V
	C505	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C506	QFV71HJ-683	TF CAPACITOR	0.068μF,50V
	or	QFV11HJ-683	MMT CAP	0.068μF,50V
	C507	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C508	QEK61AM-226	E CAPACITOR	22μF,10V
	C509	QCVB1CM-103	CAPACITOR	0.01μF,16V
	L501	PU59152-270J	COIL	27μH
	CN401	PU59555-4	CAP HOUSING	
	CN402	PU58844-3	CAP HOUSING	
	CN501	PU59555-2	CAP HOUSING	
⚠	CP401	ICP-F15	CIRCUIT PROTECTOR	

—MECHACON SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC601	M37419M8-106SP	IC	
	IC602	CAT35C104P-007	IC,E	
		CAT35C104P-006	IC,EG	
	or	CAT35C104P-013	IC,EG	
	or	CAT35C104P-014	IC,E	
	IC603	BA6251	IC	
	Q601	2SB1425(EU)	TRANSISTOR	
	Q602	DTC114ES	TRANSISTOR	
	Q603	DTC144ES	TRANSISTOR	
	Q604	DTC114ES	TRANSISTOR	
	Q605	DTC114ES	TRANSISTOR	
	D601	HZS7.5EB2	ZENER DIODE	
	or	UZ7.5BSB	ZENER DIODE	
	or	MTZ7.5B	ZENER DIODE	
	D602	1SS133	DIODE	
	or	MA165	DIODE	
	D603	1SS133	DIODE	
	or	MA165	DIODE	
	D604	1SS133	DIODE	
	or	MA165	DIODE	
	D605	1SS133	DIODE	
	or	MA165	DIODE	
	D606	1SS133	DIODE	
	or	MA165	DIODE	
	D607	1SS133	DIODE	
	or	MA165	DIODE	
	D608	1SS133	DIODE	
	or	MA165	DIODE	
	D609	1SS133	DIODE	
	or	MA165	DIODE	
	D610	11ES2	DIODE	
	or	ERA15-02	DIODE	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
		or 1SR139-200	DIODE	
		or S5688G	DIODE	
	R601	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R602	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R603	QRD161J-102	RESISTOR	1kΩ,1/6W
	R604	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R605	QRD161J-102	RESISTOR	1kΩ,1/6W
	R606	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R607	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R608	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R609	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R610	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R611	QRD161J-103	RESISTOR	10kΩ,1/6W
	R612	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R613	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R614	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R615	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R616	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R617	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R618	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R619	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R620	QRD161J-105	RESISTOR	1MΩ,1/6W
		or QRD162J-105	RESISTOR	1MΩ,1/6W
	R621	QRD161J-103	RESISTOR	10kΩ,1/6W
	R622	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R623	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R624	QRD161J-102	RESISTOR	1kΩ,1/6W
	R625	QRD161J-102	RESISTOR	1kΩ,1/6W
	R626	QRD161J-102	RESISTOR	1kΩ,1/6W
	R627	QRD161J-102	RESISTOR	1kΩ,1/6W
	R628	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R629	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R630	QRD161J-333	RESISTOR	33kΩ,1/6W
	R631	QRD161J-103	RESISTOR	10kΩ,1/6W
	R632	QRD161J-563	RESISTOR	56kΩ,1/6W
	R633	QRD161J-333	RESISTOR	33kΩ,1/6W
	R634	QRD161J-154	RESISTOR	150kΩ,1/6W
	R635	QRD161J-224	RESISTOR	220kΩ,1/6W
	R636	QRD161J-303	RESISTOR	30kΩ,1/6W
	R637	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R638	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R639	QRD161J-103	RESISTOR	10kΩ,1/6W
	R640	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R641	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R642	QRD161J-273	RESISTOR	27kΩ,1/6W
	R643	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R644	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R645	QRD161J-681	RESISTOR	680Ω,1/6W
	R646	QRD161J-103	RESISTOR	10kΩ,1/6W
	RA601	QRB045J-103XC	RESISTOR ARRAY	
	RA602	QRB037J-333	NETWORK RESISTOR	
	C601	QEK61HM-105	E CAPACITOR	1μF,50V
	C602	QEK60JM-107	E CAPACITOR	100μF,6.3V
	C603	QEK61EM-335	E CAPACITOR	3.3μF,25V
	C604	QCFB1EZ-223	CAPACITOR	0.022μF,25V
	C605	QCC11EK-104	CAPACITOR	0.1μF,25V
	C606	QCBB1HJ-471	CAPACITOR	470pF,50V
	C607	QCBB1HJ-121	CAPACITOR	120pF,50V
	C609	QCSB1HJ-2R7	CAPACITOR	2.7pF,50V
	L601	PU59152-2R2J	COIL	2.2μH
⚠	CF601	PEVB0340	CERAMIC FILTER	
	CN601	PW30602-17740	PARALLEL WIRE	
	CN602	PU59555-4	CAP HOUSING	
	CN603	PU59555-13	CAP HOUSING	
	CN604	PU59555-8	CAP HOUSING	
	CN605	PU59555-8	CAP HOUSING	
	CN606	PU59555-6	CAP HOUSING	
⚠	CP601	ICP-F25	CIRCUIT PROTECTOR	

—VPS BOARD ASSEMBLY— (EG ONLY)

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC101	SDA5642	IC,EG	
	R121	QRD161J-824	RESISTOR,EG	820kΩ,1/6W
	R122	QRD161J-101	RESISTOR,EG	100Ω,1/6W
	R123	QRD161J-562	RESISTOR,EG	5.6kΩ,1/6W
	R124	QRD161J-104	RESISTOR,EG	100kΩ,1/6W
	R127	QRD161J-105	RESISTOR,EG	1MΩ,1/6W
	R128	QRD161J-824	RESISTOR,EG	820kΩ,1/6W
	R129	QRD161J-202	RESISTOR,EG	2kΩ,1/6W
	R134	QRD161J-271	RESISTOR,EG	270Ω,1/6W
	R135	QRD161J-271	RESISTOR,EG	270Ω,1/6W
	C108	QFN31HJ-104	M CAPACITOR,EG	0.1μF,50V
	C109	QFN31HJ-333	M CAPACITOR,EG	0.033μF,50V
	C110	QCVB1CN-103	CAPACITOR,EG	0.01μF,16V
	C112	QCBB1HJ-151	CAPACITOR,EG	150pF,50V
	CN101	PU59555-5	CAP HOUSING,EG	
		PU59555-3	CAP HOUSING,E	

—REGULATOR BOARD ASSEMBLY—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
⚠	Q851	2SB810H,J	TRANSISTOR	
	D851	1SS133	DIODE	
		or MA165	DIODE	
	D852	1SS133	DIODE	
		or MA165	DIODE	
	D853	1SS133	DIODE	
		or MA165	DIODE	
	R851	QRD161J-393	RESISTOR	39kΩ,1/6W
	R852	QRD161J-102	RESISTOR	1kΩ,1/6W
	C853	QCBB1HJ-151	CAPACITOR	150pF,50V
	L851	PU59152-100J	COIL	10μH
	L853	PU59152-101J	COIL	100μH
⚠	TH801	PU52108-1R0	POSITIVE THERMISTOR	
	CN801	PU61044-12	CAP HOUSING	
	CN802	PU58844-3	CAP HOUSING	

—ON SCREEN BOARD ASSEMBLY—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC901	M50552-148SP	IC	
	IC951	M52684AP	IC	
	IC952	BU4013B	IC	
	or	TC4013BP	IC	
	Q901	DTA114ES	TRANSISTOR	
	Q902	DTA114ES	TRANSISTOR	
	Q903	2SA933S(RS)	TRANSISTOR	
	or	2SA1267(YG)-TJK	TRANSISTOR	
	Q951	DTC114ES	TRANSISTOR	
	R901	QRD161J-471	RESISTOR	470Ω,1/6W
	R902	QRD161J-103	RESISTOR	10kΩ,1/6W
	R903	QRD161J-681	RESISTOR	680Ω,1/6W
	R904	QRD161J-103	RESISTOR	10kΩ,1/6W
	R905	QRD161J-102	RESISTOR	1kΩ,1/6W
	R906	QRD161J-471	RESISTOR	470Ω,1/6W
	R907	QRD161J-471	RESISTOR	470Ω,1/6W
	R908	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R909	QRD161J-752	RESISTOR	7.5kΩ,1/6W
	R911	QRD161J-622	RESISTOR	6.2kΩ,1/6W
	R912	QRD161J-242	RESISTOR	2.4kΩ,1/6W
	R916	QRD161J-123	RESISTOR	12kΩ,1/6W
	R917	QRD161J-123	RESISTOR	12kΩ,1/6W
	R918	QRD161J-103	RESISTOR	10kΩ,1/6W
	R919	QRD161J-102	RESISTOR	1kΩ,1/6W
	R920	QRD161J-105	RESISTOR	1MΩ,1/6W
	R924	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R926	QRD161J-102	RESISTOR	1kΩ,1/6W
	R928	QRD161J-471	RESISTOR	470Ω,1/6W
	R951	QRD161J-103	RESISTOR	10kΩ,1/6W
	R952	QRD161J-103	RESISTOR	10kΩ,1/6W
	R953	QRD161J-271	RESISTOR	270Ω,1/6W
	R954	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R955	QRD161J-154	RESISTOR	150kΩ,1/6W
	R956	QRD161J-473	RESISTOR	47kΩ,1/6W
	C901	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C902	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C903	QETC1CM-106	E CAPACITOR	10μF,16V
	C904	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C905	QAT3123-450	TRIM CAP,CHCTR POS	45pF
	C906	QCSB1HJ-220	CAPACITOR	22pF,50V
	C907	QCSB1HJ-330	CAPACITOR	33pF,50V
	C908	QCSB1HJ-360	CAPACITOR	36pF,50V
	C909	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C910	QCSB1HJ-270	CAPACITOR	27pF,50V
	C911	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C912	QCSB1HJ-270	CAPACITOR	27pF,50V
	C913	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C914	QEK61CM-106	E CAPACITOR	10μF,16V
	C915	QCT25CH-150	CAPACITOR	15pF
	C916	QAT3123-200	TRIMMER CAPACITOR,BG COL	20pF
	C917	QCT25CH-5R0	CAPACITOR	5pF
	C921	QCBB1HJ-331	CAPACITOR	330pF,50V
	C951	QFN31HJ-222	M CAPACITOR	0.0022μF,50V
	C952	QCSB1HJ-220	CAPACITOR	22pF,50V
	C953	QCXB1CN-152	CAPACITOR	0.0015μF,16V
	C954	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C955	QER61HM-105	E CAPACITOR	1μF,50V
	C956	QETC1CM-106	E CAPACITOR	10μF,16V
	C957	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C958	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C959	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C960	QCVB1CN-103	CAPACITOR	0.01μF,16V
	L901	PU54223-101K	COIL	100μH
	L902	PU59152-220J	COIL	22μH
	L903	PU59152-8R2J	COIL	8.2μH
	L904	PU59152-150J	COIL	15μH
	L905	PU59152-220J	COIL	22μH
	L906	PU59152-220J	COIL	22μH
⚠	CF951	PU60086	RESONATOR	
⚠	X901	PU60908	CRYSTAL RESONATOR	
	TP901	PU57545	TEST PIN	
	TP902	PU57545	TEST PIN	
	CN901	PU59555-7	CAP HOUSING	

—TERMINAL BOARD ASSEMBLY <06>—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB30080J	TERMINAL BOARD ASSEMBLY	
	IC1	LA7222	IC	
	IC2	BA15218	IC	
	D1	1SS133	DIODE	
	or	MA165	DIODE	
	D2	1SS133	DIODE	
	or	MA165	DIODE	
	R1	QRD161J-471	RESISTOR	470Ω,1/6W
	R2	QRD161J-471	RESISTOR	470Ω,1/6W
	R3	QRD161J-103	RESISTOR	10kΩ,1/6W
	R4	QRD161J-103	RESISTOR	10kΩ,1/6W
	R5	QRD161J-273	RESISTOR	27kΩ,1/6W
	R6	QRD161J-273	RESISTOR	27kΩ,1/6W
	R7	QRD161J-563	RESISTOR	56kΩ,1/6W
	R8	QRD161J-563	RESISTOR	56kΩ,1/6W
	R9	QRD161J-563	RESISTOR	56kΩ,1/6W
	R10	QRD161J-563	RESISTOR	56kΩ,1/6W
	R11	QRD161J-471	RESISTOR	470Ω,1/6W
	R12	QRD161J-471	RESISTOR	470Ω,1/6W
	R13	QRD161J-223	RESISTOR	22kΩ,1/6W
	C1	QEK61HM-475	E CAPACITOR	4.7μF,50V
	C2	QEK61HM-475	E CAPACITOR	4.7μF,50V
	C3	QER61CM-106	E CAPACITOR	10μF,16V
	C4	QEK61CM-106	E CAPACITOR	10μF,16V
	C6	QEP61EM-475	NP E CAPACITOR	4.7μF,25V
	C7	QEP61EM-475	NP E CAPACITOR	4.7μF,25V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C8	QCBB1HJ-821	CAPACITOR	820pF,50V
	C9	QCBB1HJ-821	CAPACITOR	820pF,50V
	C10	QCBB1HJ-471	CAPACITOR	470pF,50V
	C11	QCBB1HJ-471	CAPACITOR	470pF,50V
	L1	PU59152-5R6J	COIL	5.6µH
	L2	PU59152-5R6J	COIL	5.6µH
	L3	PU59152-220J	COIL	22µH
	L4	PU59152-220J	COIL	22µH
	K1	PU60281-5	FERRITE BEADS	
	JP1	PU60770-111	PIN HEADER	
	SCW1	SDSF2608Z	SCREW, X3	
	CN1	PU59555-5	CAP HOUSING,EG	
		PU59555-3	CAP HOUSING,E	
	CN2	PU59555-4	CAP HOUSING,E	

—MIC MIX BOARD ASSEMBLY—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC1	BA15218N	IC	
		or XRA15218N	IC	
	Q1	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q2	2SD1468S(RS)	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	R2	QRD161J-202	RESISTOR	2kΩ,1/6W
	R3	QRD161J-104	RESISTOR	100kΩ,1/6W
	R4	QRD161J-221	RESISTOR	220Ω,1/6W
	R5	QRD161J-273	RESISTOR	27kΩ,1/6W
	R6	QRD161J-154	RESISTOR	150kΩ,1/6W
	R7	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R8	QRD161J-223	RESISTOR	22kΩ,1/6W
	R9	QRD161J-683	RESISTOR	68kΩ,1/6W
	R10	QRD161J-102	RESISTOR	1kΩ,1/6W
	R11	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R12	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R13	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R14	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R15	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R16	QRD161J-223	RESISTOR	22kΩ,1/6W
	R17	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R18	QRD161J-101	RESISTOR	100Ω,1/6W
	C1	QENC1CM-106	NP E CAPACITOR	10µF,16V
	C2	QENC1CM-106	NP E CAPACITOR	10µF,16V
	C3	QEK61HM-105	E CAPACITOR	1µF,50V
	C4	QEK61HM-105	E CAPACITOR	1µF,50V
	C5	QEK51HM-105	E CAPACITOR	1µF,50V
	C6	QEK61EM-475	E CAPACITOR	4.7µF,25V
	C7	QEK61EM-475	E CAPACITOR	4.7µF,25V
	C8	QEK51CM-476	E CAPACITOR	47µF,16V
	C9	QEK51CM-476	E CAPACITOR	47µF,16V
	C10	QETC1CM-476	E CAPACITOR	47µF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C11	QCBB1HJ-151	CAPACITOR	150pF,50V
	SLD1	PQ42581	PRE AMP SHIELD1	
	SLD2	PQ42583	PRE AMP SHIELD3	
	CN2	PU58844-5	CAP HOUSING	
	CN3	PU59555-4	CAP HOUSING	

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VIDEO UNIT BOARD ASSEMBLY <05>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10256A-04	VIDEO UNIT BOARD ASSEMBLY
	IC1	PB20166G-01	Y MODULE BOARD ASSY
⚠	IC2	MSM6967RS	IC
	IC201	PB20227A	COL MODULE BOARD ASSY
	IC251	BA7106LS	IC
		or XRA7106LS	IC
	Q1	DTA144EU	TRANSISTOR
	Q2	2SC2412K	TRANSISTOR
	Q3	DTC144EK	TRANSISTOR
	Q4	2SA1037K	TRANSISTOR
	Q5	2SC2412K	TRANSISTOR
	Q201	2SC2412K	TRANSISTOR
	Q202	2SC2412K	TRANSISTOR
	Q203	DTC114WK	TRANSISTOR
	Q204	2SC2412K	TRANSISTOR
	Q205	2SA1037K	TRANSISTOR
	Q251	DTC114WK	TRANSISTOR
	D1	1SS133	DIODE
		or MA165	DIODE
	D2	1SS133	DIODE
		or MA165	DIODE
	D3	1SS133	DIODE
		or MA165	DIODE
	D4	1SS133	DIODE
		or MA165	DIODE
	D5	1SS292	DIODE
	D6	1SS133	DIODE
		or MA165	DIODE
	D7	1SS133	DIODE
		or MA165	DIODE
	D9	RD9.1ES-T1B2	ZENER DIODE
		or UZ9.1BSB	ZENER DIODE
	D10	1SS133	DIODE
		or MA165	DIODE
	D201	1SS133	DIODE
		or MA165	DIODE
	D202	1SS133	DIODE
		or MA165	DIODE
	D203	1SS133	DIODE
		or MA165	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D251	1SS133	DIODE	
		or MA165	DIODE	
	D252	1SS133	DIODE	
		or MA165	DIODE	
	D253	1SS133	DIODE	
		or MA165	DIODE	
	R1	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R2	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R3	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R5	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R6	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R7	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	R8	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R9	QRSA08J-394YN	RESISTOR	390kΩ,1/10W
	R10	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R11	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R12	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R13	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R14	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R15	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R16	QVZ3518-222AZ	V RESISTOR,NC BALANCE	
		or QVZ3523-222AZ	V RESISTOR,NC BALANCE	
	R17	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R18	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
⚠	R20	QRD161J-181	RESISTOR	180Ω,1/6W
	R201	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
	R202	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R203	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R204	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R205	QRD161J-223	RESISTOR	22kΩ,1/6W
	R206	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R207	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R208	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R209	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R210	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R211	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R212	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
	R213	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R214	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R215	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R216	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R217	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R218	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R219	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R220	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R221	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R222	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R223	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R224	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R251	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R252	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R253	QRD161J-273	RESISTOR	27kΩ,1/6W
	R254	QRSA08J-914YN	RESISTOR	910kΩ,1/10W
	R255	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R256	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	C1	QCSA1HJ-220	CAPACITOR	22pF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C2	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C3	QCSA1HJ-151	CAPACITOR	150pF,50V
	C4	QETC1AM-226	E CAPACITOR	22μF,10V
	C5	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C6	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C7	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C8	QEN60JM-336	NP E CAPACITOR	33μF,6.3V
	C9	QETC1CM-106	E CAPACITOR	10μF,16V
	C10	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C11	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C12	QEN61HM-224	NP E CAPACITOR	0.22μF,50V
		or QENC1HM-224	NP.E CAP	0.22μF,50V
	C13	QCSA1HJ-120	CAPACITOR	12pF,50V
	C14	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C15	QCVC1CN-103	CAPACITOR	0.01μF,16V
	C16	QEN61HM-335	NP E CAPACITOR	3.3μF,50V
	C17	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C18	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C19	QEN61HM-225	NP E CAPACITOR	2.2μF,50V
	C20	QCSA1HJ-120	CAPACITOR	12pF,50V
	C21	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C22	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C23	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C24	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C25	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C26	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C27	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C28	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C29	QETC1AM-476	E CAPACITOR	47μF,10V
	C201	QCSA1HJ-470	CAPACITOR	47pF,50V
	C202	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C203	QCSA1HJ-820	CAPACITOR	82pF,50V
	C204	QETC1HM-475	E CAPACITOR	4.7μF,50V
	C205	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C206	QFN31HJ-224	M CAPACITOR	0.22μF,50V
	C207	QFN31HJ-563	M CAPACITOR	0.056μF,50V
	C208	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C209	QCC31CJ-223	CAPACITOR	0.022μF,16V
	C210	QER60JM-107	E CAPACITOR	100μF,6.3V
	C211	QER61CM-106	E CAPACITOR	10μF,16V
	C212	QETC1HM-224	E CAPACITOR	0.22μF,50V
	C213	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C214	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C215	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C218	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C219	QCC11CJ-473	CAPACITOR	0.047μF,16V
	C220	QCBB1HJ-121	CAPACITOR	120pF,50V
	C221	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C223	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C251	QETC1CM-106	E CAPACITOR	10μF,16V
	C252	QFN31HJ-471	M CAPACITOR	470pF,50V
	C253	QCSA1HJ-270	CAPACITOR	27pF,50V
	C254	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C255	QCYA1HK-472	CAPACITOR	0.0047μF,50V
	C256	QCYA1HK-471	CAPACITOR	470pF,50V
	C257	QCSA1HJ-5R0	CAPACITOR	5pF,50V
	C258	QCFA1HZ-103	CAPACITOR	0.01μF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C259	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C260	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C261	QCSA1HJ-200	CAPACITOR	20pF,50V
	C262	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C263	QETB0JM-477	E CAPACITOR	470μF,6.3V
	C264	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C265	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	L1	PU59152-121J	COIL	120μH
	L2	PU59152-680J	COIL	68μH
	L3	PU48530-101K	COIL	100μH
	L4	PU59152-R22J	COIL	0.22μH
	L5	PU59152-101J	COIL	100μH
	L6	PU59152-R22J	COIL	0.22μH
	L201	PU48530-271J	COIL	270μH
	L202	PU59153-822J	COIL	8.2mH
⚠	L203	PU48530-151J	COIL	150μH
	L205	PU59152-150J	COIL	15μH
	L251	PU59152-330J	COIL	33μH
	L252	PU48530-101K	COIL	100μH
	EQ2	PU60162-2	EQUALIZER	
		or PU60162	EQUALIZER	
	EQ201	PU53501-11	EQUALIZER	
		or PU53501-6	EQUALIZER	
	LPF1	PU58021-3	LOW PASS FILTER	
		or PU58021-2	LOW PASS FILTER	
		or PU60715	LOW PASS FILTER	
	LPF2	PU60716	LOW PASS FILTER	
	LPF201	PU58022	LOW PASS FILTER	
	BPF201	PU60654	BAND PASS FILTER	
		or PU60654-2	BAND PASS FILTER	
	BPF202	PU60713	BAND PASS FILTER	
	CF201	PU57073	CERAMIC FILTER	
	DL201	PU60340-2	COMB FILTER	
		or PU60490	COMB FILTER	
		or PU58971-3	COMB FILTER	
	LC251	PU60655	COIL,SECAM DET	
⚠	X201	PU60653	CRYSTAL UNITS	
	SLD1	PQ42994	SHIELD PLATE	
	SLD2	PQ42995	SHIELD CASE	
	SLD3	PQ42996	SHIELD COVER	
	TP21	PU56347	TEST POINT	
	CN1	PU60330-113	CONNECTOR	
	CN2	PU60330-113	CONNECTOR	
	CN3	PU60330-110	CONNECTOR, (TERMINAL)	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	

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IF BOARD ASSEMBLY <07>

	PWBA	PB10367P	IF BOARD ASSEMBLY	
	IC1	M51365SP	IC	
	Q1	2SA1532(C)	TRANSISTOR	
	Q2	2SC3354	TRANSISTOR	
	Q3	2SC1317(RS)	TRANSISTOR	
	Q4	2SA933S(S)	TRANSISTOR	
	Q5	2SD1819A(RS)	TRANSISTOR	
	Q6	FMS2	TRANSISTOR	
	Q7	2SC1740(RS)	TRANSISTOR	
		or 2SC3311A(RS)	TRANSISTOR	
		or 2SC536SPA(FG)	TRANSISTOR	
	Q8	2SA1532(C)	TRANSISTOR	
	Q10	2SC3354	TRANSISTOR	
	Q11	2SC1740(RS)	TRANSISTOR	
		or 2SC536SPA(FG)	TRANSISTOR	
		or 2SC3311A(RS)	TRANSISTOR	
	Q12	DTC144EU	TRANSISTOR	
	Q13	DTC144ES	TRANSISTOR	
		or UN4213	TRANSISTOR	
		or 2SC3399	TRANSISTOR	
	Q15	2SK381(C)	FE TRANSISTOR	
	D1	MTZ10D	ZENER DIODE	
	D6	DA204U	DIODE	
	R1	NRD718J-750NBU	RESISTOR	75Ω,1/8W
	R4	NRD718J-392NBU	RESISTOR	3.9kΩ,1/8W
	R5	NRD718J-151NBU	RESISTOR	150Ω,1/8W
	R6	NRD718J-272NBU	RESISTOR	2.7kΩ,1/8W
	R7	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R8	NRD718J-681NBU	RESISTOR	680Ω,1/8W
	R10	NRD718J-471NBU	RESISTOR	470Ω,1/8W
	R11	NRD718J-101NBU	RESISTOR	100Ω,1/8W
	R14	NRD718J-101NBU	RESISTOR	100Ω,1/8W
	R15	NRD718J-271NBU	RESISTOR	270Ω,1/8W
	R17	NRD718J-562NBU	RESISTOR	5.6kΩ,1/8W
	R18	NRD718J-332NBU	RESISTOR	3.3kΩ,1/8W
	R19	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R20	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R21	QVZ3518-472	V RESISTOR, RF AGC	
		or QVZ3523-472	V RESISTOR, RF AGC	
	R22	NRD718J-824NBU	RESISTOR	820kΩ,1/8W
	R24	NRD718J-821NBU	RESISTOR	820Ω,1/8W
	R31	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R32	NRD718J-102NBU	RESISTOR	1kΩ,1/8W
	R33	NRD718J-223NBU	RESISTOR	22kΩ,1/8W
	R34	NRD718J-470NBU	RESISTOR	47Ω,1/8W
	R35	NRD718J-561NBU	RESISTOR	560Ω,1/8W
	R36	NRD718J-561NBU	RESISTOR	560Ω,1/8W
	R37	NRD718J-101NBU	RESISTOR	100Ω,1/8W
	R38	NRD718J-182NBU	RESISTOR	1.8kΩ,1/8W
	R39	NRD718J-272NBU	RESISTOR	2.7kΩ,1/8W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R40	QVZ3518-103	V RESISTOR,COLOR LEVEL	
	or	QVZ3523-103	V RESISTOR,COLOR LEVEL	
	R45	NRD718J-471NBU	RESISTOR	470Ω,1/8W
	R46	NRD718J-104NBU	RESISTOR	100kΩ,1/8W
	R47	NRD718J-153NBU	RESISTOR	15kΩ,1/8W
	R48	NRD718J-392NBU	RESISTOR	3.9kΩ,1/8W
	R49	NRD718J-103NBU	RESISTOR	10kΩ,1/8W
	R50	NRD718J-471NBU	RESISTOR	470Ω,1/8W
	R51	NRD718J-223NBU	RESISTOR	22kΩ,1/8W
	R52	NRD718J-223NBU	RESISTOR	22kΩ,1/8W
	R53	NRD718J-103NBU	RESISTOR	10kΩ,1/8W
	R54	NRD718J-822NBU	RESISTOR	8.2kΩ,1/8W
	R57	NRD718J-153NBU	RESISTOR	15kΩ,1/8W
	R62	NRD718J-392NBU	RESISTOR	3.9kΩ,1/8W
	R64	NRD718J-182NBU	RESISTOR	1.8kΩ,1/8W
	R65	NRD718J-221NBU	RESISTOR	220Ω,1/8W
	R66	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R71	NRD718J-681NBU	RESISTOR	680Ω,1/8W
	R72	NRD718J-330NBU	RESISTOR	33Ω,1/8W
	R73	NRD718J-331NBU	RESISTOR	330Ω,1/8W
	R82	NRD718J-680NBU	RESISTOR	68Ω,1/8W
	R83	NRD718J-331NBU	RESISTOR	330Ω,1/8W
	R84	NRD718J-393NBU	RESISTOR	39kΩ,1/8W
	R85	NRD718J-752NBU	RESISTOR	7.5kΩ,1/8W
	R86	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R100	NRD718J-105NBU	RESISTOR	1MΩ,1/8W
	R101	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R102	NRD718J-222NBU	RESISTOR	2.2kΩ,1/8W
	R110	QRD162J-683	RESISTOR	68kΩ,1/6W
	C2	NCT02CH-3R9NBR	CAPACITOR	3.9pF
	C3	QCT25HH-101	CAPACITOR	100pF
	C4	NCT02CH-4R7NBR	CAPACITOR	4.7pF
	C5	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C6	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
	C7	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C8	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C10	QETC1CM-107	E CAPACITOR	100μF,16V
	C11	NCY71CM-103NBR	CAPACITOR	0.01μF,16V
	C13	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
	C14	PU57601-474ME	E CAPACITOR	0.47μF
	C15	QETC1CM-336	E CAPACITOR	33μF,16V
	C16	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
	C17	NCF71EZ-223NBR	CAPACITOR	0.022μF,25V
	C19	NCY71CM-103NBR	CAPACITOR	0.01μF,16V
	C20	NCY71CM-103NBR	CAPACITOR	0.01μF,16V
	C21	NCB71HK-101NBR	CAPACITOR	100pF,50V
	C24	QETC1HM-105	E CAPACITOR	1μF,50V
	C25	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
	C26	QFN31HK-222	M CAPACITOR	0.0022μF,50V
	C27	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C29	NCS71HJ-470NBR	CAPACITOR	47pF,50V
	C31	QETC1HM-335	E CAPACITOR	3.3μF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C32	NCF71EZ-223NBR	CAPACITOR	0.022μF,25V
	C33	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C41	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C43	NCX71CM-222NBR	CAPACITOR	0.0022μF,16V
	C44	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C45	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C46	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C50	QETC1CM-336	E CAPACITOR	33μF,16V
	C56	QETC1CM-336	E CAPACITOR	33μF,16V
	C58	NCS71HJ-100NBR	CAPACITOR	10pF,50V
	C63	NCB71HK-102NBR	CAPACITOR	0.001μF,50V
	C64	NCB71HK-391NBR	CAPACITOR	390pF,50V
	L1	PU60025-R68	COIL	0.68μH
	L2	PU60025-R82	COIL	0.82μH
	L3	PU60025-1R5	COIL	1.5μH
	L4	PU59152-8R2J	COIL	8.2μH
	L5	PU59152-220J	COIL	22μH
	L6	PU59152-6R8K	COIL	6.8μH
	or	PU59152-6R8J	COIL	6.8μH
	L7	PU59152-R22K	COIL	0.22μH
	L9	PU59152-6R8K	COIL	6.8μH
	CF1	PU49295-2	N FILTER	
	CF3	PU32990-2	CERAMIC FILTER	
	CF4	PU49295	CERAMIC FILTER	
	CF5	PU32990-4	CERAMIC FILTER	
	SAW1	PU35557-7	SAW FILTER	
	SAW2	PU60765	SAW FILTER	
	T1	PU60042-2	COIL	
	T2	PU60497	IF.TRANSFORMER,VCO	
	T4	PU59488	COIL	
	T5	PU60046	IF.TRANSFORMER,SYNC DET	
	T8	PU60259	COIL	
	JP1	PU59935-16	CONNECTOR, (TERMINAL)	

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TUNER CONTROL BOARD ASSEMBLY <08>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB20326N	TUNER CONTROL BOARD ASSY,EG
		PB20326P	TUNER CONTROL BOARD ASSY,E
⚠	TNR1	PERF0023	UHF/VHF TUNER,EG
⚠		PERF0024	UHF/VHF TUNER,E
	Q2	2SD1863(QR)	TRANSISTOR
	or	2SC3243D,E	TRANSISTOR
	Q3	2SB810H,J	TRANSISTOR
	Q4	DTC144ES	TRANSISTOR
	or	UN4213	TRANSISTOR
	or	2SC3399	TRANSISTOR
	Q6	2SC3313CTA	TRANSISTOR
	D1	HZT33-02	ZENER DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D2	E-452-2	DIODE	
	D3	RD5.6ES-T1B3	ZENER DIODE	
		or MTZ5.6CT-77	ZENER DIODE	
	D4	1SS133	DIODE	
	D5	1SS133	DIODE	
	R2	QRD161J-104	RESISTOR	100kΩ,1/6W
	R3	QRD161J-153	RESISTOR	15kΩ,1/6W
	R7	QRD161J-271	RESISTOR	270Ω,1/6W
	R8	QRD161J-153	RESISTOR	15kΩ,1/6W
	R9	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R30	QRD161J-331	RESISTOR	330Ω,1/6W
	R32	QRD161J-103	RESISTOR	10kΩ,1/6W
	R36	QRD161J-560	RESISTOR	56Ω,1/6W
	R45	QRD161J-0R0	RESISTOR	0Ω,1/6W
	C1	QETC1CM-337	E CAPACITOR	330μF,16V
	C2	QETC1HM-225	E CAPACITOR	2.2μF,50V
	C4	QCBB1HK-102	CAPACITOR	0.001μF,50V
	C5	QCBB1HK-102	CAPACITOR	0.001μF,50V
	C6	QCBB1HJ-181	CAPACITOR	180pF,50V
	C7	QCBB1HJ-471	CAPACITOR	470pF,50V
	C14	QETC1CM-336	E CAPACITOR	33μF,16V
	C15	QETC1CM-107	E CAPACITOR	100μF,16V
	C16	QETC1CM-106	E CAPACITOR	10μF,16V
	C23	QETC1HM-106	E CAPACITOR	10μF,50V
	C26	QCBB1HJ-471	CAPACITOR	470pF,50V
	C28	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C29	QCBB1HJ-910	CAPACITOR	91pF,50V
	L1	PU59152-R22K	COIL	0.22μH
	L2	PU59152-6R8K	COIL	6.8μH
	L4	PU59152-1R0K	COIL	1.0μH
	L5	PU59152-100J	COIL	10μH
	L7	PU59152-2R7K	COIL	2.7μH
	L9	PU59152-5R6J	COIL	5.6μH
	L10	PU59152-1R0K	COIL	1.0μH
	HD1	PU36416-1-3	HOLDER	
	CN1	PU58844-6	CAP HOUSING	
	CN2	PU59555-8	CAP HOUSING	
	CN3	PU58844-6	CAP HOUSING	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

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AUDIO BOARD ASSEMBLY <09>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20390F-01	AUDIO BOARD ASSEMBLY,E	
		PB20390E-01	AUDIO BOARD ASSEMBLY,EG	
	IC1	AN3380NK	IC	
	IC2	TA7361AP	IC	
	IC3	PB20167A-02	FMA MODULE BOARD ASSY	
	Q1	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q2	2SC1740S(Q)	TRANSISTOR	
	Q3	DTC114ES	TRANSISTOR	
	Q4	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q5	DTC114ES	TRANSISTOR	
	Q6	DTC114ES	TRANSISTOR	
	Q7	DTC114ES	TRANSISTOR	
	Q8	DTA114ES	TRANSISTOR	
	Q9	DTA114ES	TRANSISTOR	
	Q12	DTC143TS	TRANSISTOR	
	Q13	DTC143TS	TRANSISTOR	
	Q16	2SC1740S(Q)	TRANSISTOR	
	Q17	DTA114ES	TRANSISTOR	
	Q22	2SC1740S(RS)	TRANSISTOR	
		or 2SC3199(GB)-TJK	TRANSISTOR	
	Q101	2SD1468S(RS)	TRANSISTOR	
	Q102	2SA854S(QR)	TRANSISTOR	
	D3	1SS133	DIODE	
		or MA165	DIODE	
	D4	1SS133	DIODE	
		or MA165	DIODE	
	D7	1SS133	DIODE	
		or MA165	DIODE	
	D9	HZ2BLL	ZENER DIODE	
	D12	1SS133	DIODE	
		or MA165	DIODE	
	D21	1SS133	DIODE	
		or MA165	DIODE	
	R1	QRD162J-221	RESISTOR	220Ω,1/6W
	R3	QRD161J-102	RESISTOR	1kΩ,1/6W
	R4	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R5	QRD161J-271	RESISTOR	270Ω,1/6W
	R6	QRD161J-331	RESISTOR	330Ω,1/6W
	R7	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R8	QRD161J-100	RESISTOR	10Ω,1/6W
	R9	QVZ3523-683AZ	V RESISTOR,BIAS ADJ	
		or QVZ3518-683AZ	V RESISTOR,BIAS ADJ	
	R10	QRD161J-333	RESISTOR	33kΩ,1/6W
	R11	QRD161J-473	RESISTOR	47kΩ,1/6W
	R12	QRD161J-101	RESISTOR	100Ω,1/6W
	R13	QRD161J-473	RESISTOR	47kΩ,1/6W
	R14	QRD161J-6R8	RESISTOR	6.8Ω,1/6W
	R15	QRD161J-103	RESISTOR	10kΩ,1/6W
	R18	QRD161J-153	RESISTOR	15kΩ,1/6W
	R20	QRD161J-223	RESISTOR	22kΩ,1/6W
	R21	QRD161J-271	RESISTOR	270Ω,1/6W
	R22	QRD161J-151	RESISTOR	150Ω,1/6W
	R23	QRD161J-303	RESISTOR	30kΩ,1/6W
	R25	QRD161J-103	RESISTOR	10kΩ,1/6W
	R26	QRD161J-334	RESISTOR	330kΩ,1/6W
	R27	QRD161J-561	RESISTOR	560Ω,1/6W
	R29	QRD161J-102	RESISTOR	1kΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R31	QRD161J-151	RESISTOR	150Ω,1/6W
	R32	QRD161J-102	RESISTOR	1kΩ,1/6W
	R33	QRD161J-102	RESISTOR	1kΩ,1/6W
	R34	QRD161J-151	RESISTOR	150Ω,1/6W
	R40	QVZ3523-473AZ	V RESISTOR,EE LEVEL(L)	
		or QVZ3518-473AZ	V RESISTOR,EE LEVEL(L)	
	R41	QVZ3523-473AZ	V RESISTOR,EE LEVEL(R)	
		or QVZ3518-473AZ	V RESISTOR,EE LEVEL(R)	
	R42	QRD161J-243	RESISTOR	24kΩ,1/6W
	R43	QRD161J-101	RESISTOR	100Ω,1/6W
	R44	QRD161J-101	RESISTOR	100Ω,1/6W
	R45	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R46	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R47	QRD161J-153	RESISTOR	15kΩ,1/6W
	R48	QRD161J-223	RESISTOR	22kΩ,1/6W
	R49	QRD161J-274	RESISTOR	270kΩ,1/6W
	R50	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R51	QRD162J-222	RESISTOR	2.2kΩ,1/6W
	R52	QRD161J-103	RESISTOR	10kΩ,1/6W
	R53	QRD161J-333	RESISTOR	33kΩ,1/6W
	R54	QRD161J-223	RESISTOR	22kΩ,1/6W
	R55	QRD161J-363	RESISTOR	36kΩ,1/6W
	R58	QRD161J-333	RESISTOR	33kΩ,1/6W
	R59	QRD161J-333	RESISTOR	33kΩ,1/6W
	R60	QRD161J-333	RESISTOR	33kΩ,1/6W
	R61	QRD161J-272	RESISTOR	2.7kΩ,1/6W
	R62	QRD161J-333	RESISTOR	33kΩ,1/6W
	R63	QRD161J-102	RESISTOR	1kΩ,1/6W
	R64	QRD161J-331	RESISTOR	330Ω,1/6W
	R65	QRD161J-393	RESISTOR	39kΩ,1/6W
	R66	QRD161J-8R2	RESISTOR	8.2Ω,1/6W
	R67	QRD161J-103	RESISTOR	10kΩ,1/6W
	R68	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R69	QRD161J-390	RESISTOR	39Ω,1/6W
	R70	QRD161J-273	RESISTOR	27kΩ,1/6W
	R71	QRD161J-560	RESISTOR	56Ω,1/6W
	R72	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R73	QVZ3523-332AZ	V RESISTOR,IND(L)	
		or QVZ3518-332AZ	V RESISTOR,IND(L)	
	R74	QVZ3523-332AZ	V RESISTOR,IND(R)	
		or QVZ3518-332AZ	V RESISTOR,IND(R)	
	R75	QRD161J-560	RESISTOR	56Ω,1/6W
	R78	QRD161J-471	RESISTOR	470Ω,1/6W
	R80	QRD161J-562	RESISTOR	5.6kΩ,1/6W
	R81	QRD161J-103	RESISTOR	10kΩ,1/6W
	R82	QRD161J-153	RESISTOR	15kΩ,1/6W
	R83	QRD161J-473	RESISTOR	47kΩ,1/6W
	R84	QRD161J-473	RESISTOR	47kΩ,1/6W
	R87	QRD161J-102	RESISTOR	1kΩ,1/6W
	R88	QRD161J-102	RESISTOR	1kΩ,1/6W
	R101	QRD161J-471	RESISTOR	470Ω,1/6W
	R103	QRD161J-103	RESISTOR	10kΩ,1/6W
	R104	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	C1	QETC1CM-106	E CAPACITOR	10μF,16V
	C2	QETC1AM-476	E CAPACITOR	47μF,10V
	C3	QENC1CM-106	NP E CAPACITOR	10μF,16V
	C4	QETC1CM-106	E CAPACITOR	10μF,16
	C5	QETC1CM-226	E CAPACITOR	22μF,16
	C6	QETC1AM-336	E CAPACITOR	33μF,10
	C7	QETC1AM-476	E CAPACITOR	47μF,10
	C8	QCBB1HJ-102	CAPACITOR	0.001μF,50
	C9	QCBB1HJ-101	CAPACITOR	100pF,50
	C10	QETC1AM-336	E CAPACITOR	33μF,10
	C11	QETC1AM-107	E CAPACITOR	100μF,10
	C12	QETC1CM-226	E CAPACITOR	22μF,16
	C13	QETC1CM-106	E CAPACITOR	10μF,16
	C14	QENC1CM-106	NP E CAPACITOR	10μF,16
	C15	QETC1AM-476	E CAPACITOR	47μF,10V
	C16	QETC1CM-106	E CAPACITOR	10μF,16V
	C17	QCBB1HJ-331	CAPACITOR	330pF,50V
	C18	QFV71HJ-223	TF CAPACITOR	0.022μF,50V
	C19	QFL31HJ-102	M CAPACITOR	0.001μF,50V
	C20	QFL31HJ-102	M CAPACITOR	0.001μF,50V
	C21	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C22	QETC1HM-334	E CAPACITOR	0.33μF,50V
	C23	QCBB1HJ-331	CAPACITOR	330pF,50V
	C24	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C25	QETC1HM-225	E CAPACITOR	2.2μF,50V
	C26	QETC1AM-336	E CAPACITOR	33μF,10V
	C27	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C28	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
	C29	QFV71HJ-273	TF CAPACITOR	0.027μF,50V
	C30	QETC1CM-106	E CAPACITOR	10μF,16V
	C32	QFV71HJ-103	TF CAPACITOR	0.01μF,50V
	C33	QETC1HM-334	E CAPACITOR	0.33μF,50V
	C34	QEB51CM-685	E CAPACITOR	6.8μF,16V
	C35	QEB51HM-105	E CAPACITOR	1μF,50V
	C36	QETC1CM-106	E CAPACITOR	10μF,16V
	C37	QETC1AM-336	E CAPACITOR	33μF,10V
	C38	QETC1CM-476	E CAPACITOR	47μF,16V
	C39	QETC1AM-336	E CAPACITOR	33μF,10V
	C40	QETC1CM-106	E CAPACITOR	10μF,16V
	C41	QETC1CM-476	E CAPACITOR	47μF,16V
	C42	QETC1CM-106	E CAPACITOR	10μF,16V
	C43	QETC1CM-106	E CAPACITOR	10μF,16V
	C44	QETC1CM-106	E CAPACITOR	10μF,16V
	C45	QENC1CM-106	NP E CAPACITOR	10μF,16V
	C46	QENC1CM-106	NP E CAPACITOR	10μF,16V
	C47	QETC1HM-225	E CAPACITOR	2.2μF,50V
	C48	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C49	QCS31HJ-391	CAPACITOR	390pF,50V
	C50	QFN31HJ-102	M CAPACITOR	0.001μF,50V
	C51	QFN31HJ-102	M CAPACITOR	0.001μF,50V
	C52	QFV71HJ-224	TF CAPACITOR	0.22μF,50V
	C53	QCS31HJ-391	CAPACITOR	390pF,50V
	C54	QEK60JM-107	E CAPACITOR	100μF,6.3V
	C55	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C56	QFV71HJ-224	TF CAPACITOR	0.22μF,50V
	C57	QCSB1HJ-330	CAPACITOR	33pF,50V
	C58	QCBB1HJ-331	CAPACITOR	330pF,50V
	C59	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C60	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C61	QCBB1HJ-151	CAPACITOR	150pF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C62	QCBB1HJ-821	CAPACITOR	820pF,50V
	C63	QFL31HJ-222	M CAPACITOR	0.0022µF,50V
	C67	QETC1CM-106	E CAPACITOR	10µF,16V
	C68	QEK61HM-225	E CAPACITOR	2.2µF,50V
	C69	QEK61HM-225	E CAPACITOR	2.2µF,50V
	C72	QCBB1HJ-561	CAPACITOR	560pF,50V
	C73	QCBB1HJ-561	CAPACITOR	560pF,50V
	C74	QFL31HJ-102	M CAPACITOR	0.001µF,50V
	C75	QFL31HJ-102	M CAPACITOR	0.001µF,50V
	C76	QFV71HJ-333	TF CAPACITOR	0.033µF,50V
	C77	QETC1CM-106	E CAPACITOR	10µF,16V
	C79	QFV71HJ-273	TF CAPACITOR	0.027µF,50V
	C80	QCBB1HJ-102	CAPACITOR	0.001µF,50V
	C82	QCBB1HJ-102	CAPACITOR	0.001µF,50V
	C101	QETB1CM-227	E CAPACITOR	220µF,16V
	C103	QEK61CM-476	E CAPACITOR	47µF,16V
	L1	PU48530-181J	COIL	180µH
	L3	PU58308-682J	COIL	6.8mH
	L4	PU54223-221J	COIL	220µH
	L5	PU48530-101J	COIL	100µH
	BPF1	PU60610	BPF(1.4MHZ)	
	BPF2	PU60611	BPF(1.8MHZ)	
	HG1	PU58018-1-2	PWB HINGE, X2	
⚠	T1	PU60303	OSC TRANSFORMER	
⚠	T2	PU60304	OSC TRANSFORMER	
	SLD1	PU59960	P/R AMP SHIELD1	
	SLD2	PU59961	P/R AMP SHIELD2	
	SLD3	PU59962	P/R AMP SHIELD3	
	TP1	PU55774	TEST PIN, X6	
	CN1	PU58844-3	CAP HOUSING	
	CN2	PU59555-8	CAP HOUSING	
	CN3	PU59555-6	CAP HOUSING	
	CN5	PU58844-4	CAP HOUSING	
	CN6	PU58844-2	CAP HOUSING	
	CN7	PU58844-4	CAP HOUSING	
	CN8	PU59555-4	CAP HOUSING	
	CN9	PU59555-4	CAP HOUSING	
		PU58844-4	CAP HOUSING	
	CN10	PU59555-5	CAP HOUSING	
	CN11	PU58844-2	CAP HOUSING	
	CN12	PU59555-6	CAP HOUSING	
	CN13	PU59555-4	CAP HOUSING	
	CN15	PU59555-2	CAP HOUSING	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

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AUDIO CONTROL HEAD BOARD <12>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWB1	PB40068	AUDIO CONTROL HEAD BOARD
	CN1	PU58844-107	CAP HOUSING

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DEMODU BOARD ASSEMBLY <14>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20240F	DEMOD BOARD ASSEMBLY	
	IC1	TDA3800GS	IC	
	Q1	DTC114ES	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
		or UN4211	TRANSISTOR	
	Q2	2SD1292(QR)	TRANSISTOR	
		or 2SC3068	TRANSISTOR	
	Q3	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q4	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q5	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q6	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q7	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q8	DTC114ES	TRANSISTOR	
		or UN4211	TRANSISTOR	
		or 2SC3402	TRANSISTOR	
	Q9	2SD1450S,T	TRANSISTOR	
		or 2SD1292(QR)	TRANSISTOR	
	Q10	2SD1450S,T	TRANSISTOR	
		or 2SD1292(QR)	TRANSISTOR	
	Q11	DTA144ES	TRANSISTOR	
	D1	1SS133	DIODE	
	D2	1SS133	DIODE	
	D3	1SS133	DIODE	
	D4	1SS133	DIODE	
	D5	1SS133	DIODE	
	D6	1SS133	DIODE	
	R1	QRD161J-103	RESISTOR	10kΩ,1/6W
	R2	QVZ3518-103	V RESISTOR,SEPARATION ADJ	
	R3	QRD161J-153	RESISTOR	15kΩ,1/6W
	R4	QRD161J-331	RESISTOR	330Ω,1/6W
	R5	QRD161J-821	RESISTOR	820Ω,1/6W
	R6	QRD161J-102	RESISTOR	1kΩ,1/6W
	R7	QRD161J-104	RESISTOR	100kΩ,1/6W
	R8	QRD161J-154	RESISTOR	150kΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R9	QRD161J-271	RESISTOR	270Ω,1/6W
	R10	QRD161J-273	RESISTOR	27kΩ,1/6W
	R11	QRD161J-103	RESISTOR	10kΩ,1/6W
	R12	QRD161J-103	RESISTOR	10kΩ,1/6W
	R13	QRD161J-103	RESISTOR	10kΩ,1/6W
	R14	QRD161J-103	RESISTOR	10kΩ,1/6W
	R15	QRD161J-103	RESISTOR	10kΩ,1/6W
	R16	QRD161J-103	RESISTOR	10kΩ,1/6W
	R17	QRD161J-103	RESISTOR	10kΩ,1/6W
	R21	QVZ3518-332	V RESISTOR,L LEVEL	
	R22	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R23	QRD161J-103	RESISTOR	10kΩ,1/6W
	R24	QVZ3518-332	V RESISTOR,R LEVEL	
	R25	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R26	QRD161J-103	RESISTOR	10kΩ,1/6W
	C1	QETC1CM-106	E CAPACITOR	10µF,16V
	C2	QFN31HK-392	M CAPACITOR	0.0039µF,50V
	C3	QFN31HK-392	M CAPACITOR	0.0039µF,50V
	C4	QFN31HK-392	M CAPACITOR	0.0039µF,50V
	C5	QETC1CM-106	E CAPACITOR	10µF,16V
	C6	QETC1CM-106	E CAPACITOR	10µF,16V
	C7	QETC1CM-476	E CAPACITOR	47µF,16V
	C8	QCF31HP-223	CAPACITOR	0.022µF,50V
	C9	QCC11EK-473	CAPACITOR	0.047µF,25V
	C10	QFP31HJ-102	M CAPACITOR	0.001µF,50V
	C11	QETC1CM-477	E CAPACITOR	470µF,16V
	C12	QCC11EK-473	CAPACITOR	0.047µF,25V
	C13	QETC1CM-106	E CAPACITOR	10µF,16V
	C14	QETC1CM-106	E CAPACITOR	10µF,16V
	C15	QETC1CM-336	E CAPACITOR	33µF,16V
	C16	QETC1CM-107	E CAPACITOR	100µF,16V
	C17	QETC1HM-105	E CAPACITOR	1µF,50V
	C18	QETC1CM-476	E CAPACITOR	47µF,16V
	C20	QETC1CM-106	E CAPACITOR	10µF,16V
	BPF1	PU58226	BAND PASS FILTER	
	CF1	PU52775	CERAMIC FILTER	
	CF2	PU52775-2	CERAMIC FILTER	
	T1	PU59489	COIL	
	T2	PU59490	COIL	
	CN1	PU58844-6	CAP HOUSING	
	CN2	PU59555-4	CAP HOUSING	
	CN3	PU59555-5	CAP HOUSING	

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TIMER/DISPLAY/SW BOARD ASSEMBLY <20>

PWBA	PB10394B-01	T/D/S BOARD ASSEMBLY,E
	PB10394A-01	T/D/S BOARD ASSEMBLY,EG

—TIMER BOARD ASSEMBLY <20>—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA1	PB10394B1-01	TIMER BOARD ASSEMBLY	
	IC1	UPD75216ACW-A69	IC	
	IC2	IC-PST523H-2	IC	
	Q1	2SC3199(G)	TRANSISTOR	
	or	2SC3311A(RS)	TRANSISTOR	
	Q3	DTC124ES	TRANSISTOR	
	Q4	DTC144ES	TRANSISTOR	
	D1	RD9.1ES-T1B2	ZENER DIODE	
	D2	1SS133	DIODE	
	D3	1SS133	DIODE	
	D4	11ES2	DIODE	
	D5	11ES2	DIODE	
	D31	1SS133	DIODE,EG	
	D33	1SS133	DIODE	
	R1	QRD161J-103	RESISTOR	10kΩ,1/6W
	R4	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R5	QRD161J-333	RESISTOR	33kΩ,1/6W
	R6	QRD161J-333	RESISTOR	33kΩ,1/6W
	R7	QRD161J-102	RESISTOR	1kΩ,1/6W
	R8	QRD161J-103	RESISTOR	10kΩ,1/6W
	R9	QRD161J-103	RESISTOR	10kΩ,1/6W
	R10	QRD161J-103	RESISTOR	10kΩ,1/6W
	R11	QRD161J-103	RESISTOR	10kΩ,1/6W
	R12	QRD161J-333	RESISTOR	33kΩ,1/6W
	R13	QRD161J-271	RESISTOR	270Ω,1/6W
	R14	QRD161J-271	RESISTOR	270Ω,1/6W
	R15	QRD161J-103	RESISTOR	10kΩ,1/6W
	R16	QRD161J-103	RESISTOR	10kΩ,1/6W
	R17	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R25	QRD161J-103	RESISTOR	10kΩ,1/6W
	R26	QRD161J-103	RESISTOR	10kΩ,1/6W
	R30	QRD161J-224	RESISTOR	220kΩ,1/6W
	R31	QRD161J-151	RESISTOR,E	150Ω,1/6W
	R32	QRD161J-271	RESISTOR	270Ω,1/6W
	R33	QRD161J-271	RESISTOR	270Ω,1/6W
	R36	QRD161J-103	RESISTOR	10kΩ,1/6W
	R38	QRD161J-104	RESISTOR	100kΩ,1/6W
	R40	QRD161J-271	RESISTOR	270Ω,1/6W
	R41	QRD161J-103	RESISTOR	10kΩ,1/6W
	R42	QRD161J-561	RESISTOR	560Ω,1/6W
	R43	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R44	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R45	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R49	QRD161J-103	RESISTOR	10kΩ,1/6W
	RA1	QRB047J-333	RESISTOR ARRAY	
	or	QRB049J-333	RESISTOR ARRAY	
	RA2	QRB047J-104	NETWORK RESISTOR	
	or	QRB049J-104	NETWORK RESISTOR	
	C3	QCVB1CN-103	CAPACITOR	0.01µF,16V
	C4	QER61CM-106	E CAPACITOR	10µF,16V
	C5	QEA40HZ-104	E CAPACITOR (DOUBLE),EG	0.1µF,5.5V
		QEA40HZ-105	E CAPACITOR (DOUBLE),E	1µF,5.5V
	or	PU60676-104	E CAPACITOR	0.1µF,5.5V
	C6	QAT3123-200	TRIMMER CAPACITOR, CLOCK	20pF

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C7	QCSB1HJ-120	CAPACITOR	12pF,50V
	C11	QER61CM-106	E CAPACITOR	10μF,16V
	C13	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C15	QCBB1HJ-101	CAPACITOR	100pF,50V
	C16	QCBB1HJ-101	CAPACITOR	100pF,50V
	C17	QCF11HP-473	CAPACITOR	0.047μF,50V
	C18	QER61CM-106	E CAPACITOR	10μF,16V
	C19	QER61CM-106	E CAPACITOR	10μF,16V
	C21	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C22	QCBB1HJ-151	CAPACITOR	150pF,50V
⚠	X1	PU60226-4	CRYSTAL RESONATOR	
	K1	PU60281-5	FERRITE BEADS	
	TP1	PU56278	TEST POINT	
	CN1	PU59555-13	CAP HOUSING	
	CN2	PU58844-8	CAP HOUSING	
	CN3	PU59555-7	CAP HOUSING	
⚠	CP1	ICP-F10	CIRCUIT PROTECTOR	

—SW/DISPLAY BOARD ASSEMBLY <28>—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA2	PB10394B2-01	SW/DISP BOARD ASSEMBLY	
	IC101	GP1U541X	INFRARED RAYS UNIT	
	IC102	MSC1195SS	IC	
	IC103	MSC7112-01SS	IC	
	Q101	2SK658	FE TRANSISTOR	
	Q201	2SB643S	TRANSISTOR	
	Q202	DTA114ES	TRANSISTOR	
	D101	11ES2	DIODE	
		or ERA15-02	DIODE	
	D201	SLH-34MC3F	LE DIODE	
	D202	SLH-34VC3F	LE DIODE	
	D203	SLH-34MC3F	LE DIODE	
	D229	1SS133	DIODE	
	R101	QRD161J-102	RESISTOR	1kΩ,1/6W
	R102	QRD161J-102	RESISTOR	1kΩ,1/6W
	R103	QRD161J-102	RESISTOR	1kΩ,1/6W
	R104	QRD161J-273	RESISTOR	27kΩ,1/6W
	R107	QRD161J-102	RESISTOR	1kΩ,1/6W
	R108	QRD161J-103	RESISTOR	10kΩ,1/6W
	R109	QRD161J-103	RESISTOR	10kΩ,1/6W
	R110	QRD161J-103	RESISTOR	10kΩ,1/6W
	R111	QRD161J-103	RESISTOR	10kΩ,1/6W
	R113	QRD161J-103	RESISTOR	10kΩ,1/6W
	R116	QRD161J-103	RESISTOR	10kΩ,1/6W
	R201	QRD161J-271	RESISTOR	270Ω,1/6W
	R202	QRD161J-271	RESISTOR	270Ω,1/6W
	R203	QRD161J-271	RESISTOR	270Ω,1/6W
	R206	QRD161J-472	RESISTOR	4.7kΩ,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R207	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R217	QRD161J-273	RESISTOR	27kΩ,1/6W
	R218	QRD161J-273	RESISTOR	27kΩ,1/6W
	R219	QRD161J-473	RESISTOR	47kΩ,1/6W
	C101	QCBB1HJ-101	CAPACITOR	100pF,50V
	C102	QER61HM-104	E CAPACITOR	0.1μF,50V
	C103	QER60JM-336	E CAPACITOR	33μF,6.3V
	C104	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C105	QER61VM-106	E CAPACITOR	10μF,35V
	C106	QEN41EM-226	NP E CAPACITOR	22μF,25V
	C107	QEN41EM-226	NP E CAPACITOR	22μF,25V
	C108	QER61CM-106	E CAPACITOR	10μF,16V
	C109	QFJ41HJ-223	M CAPACITOR	0.022μF,50V
	C110	QFJ41HJ-473	M CAPACITOR	0.047μF,50V
	C111	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C112	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C113	QER61VM-226	E CAPACITOR	22μF,35V
	C114	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C115	QCSB1HJ-330	CAPACITOR	33pF,50V
	C116	QCSB1HJ-330	CAPACITOR	33pF,50V
	C117	QCF31HP-473	CAPACITOR	0.047μF,50V
	S2	PU60392-2Z	TACT SWITCH,STOP/EJECT	
	S3	PU60392-2Z	TACT SWITCH,FF	
	S4	PU60392-2Z	TACT SWITCH,REW	
	S5	PU60392-Z	TACT SWITCH,AUDIO DUB	
	S6	PU60392-Z	TACT SWITCH,REC ITR	
	S7	PU60392-2Z	TACT SWITCH,PLAY	
	S8	PU60392-2Z	TACT SWITCH,PAUSE/STILL	
	S13	PU60392-Z	TACT SWITCH,HIFI/NORN/MIX	
	S14	PU60392-Z	TACT SWITCH,AUDIO MONITOR	
	S18	PU60392-Z	TACT SWITCH,PROGRAM	
	S19	PU60392-Z	TACT SWITCH,START	
	S20	PU60392-Z	TACT SWITCH,SIMUL CANCEL	
	S21	PU60392-Z	TACT SWITCH,CANCEL	
	S22	PU60392-Z	TACT SWITCH,REPEAT	
	S23	PU60392-Z	TACT SWITCH,SELECT	
	S24	PU60392-Z	TACT SWITCH,TIMER	
	S25	PU60392-Z	TACT SWITCH,SET +	
	S26	PU60392-Z	TACT SWITCH,SET-	
	S27	PU60392-Z	TACT SWITCH,SP/HIFI-LP	
	S28	PU60392-Z	TACT SWITCH,TV/VIDEO(DISP OFF)	
	S29	PU60392-Z	TACT SWITCH,CH SEARCH	
	S30	PU60392-Z	TACT SWITCH,CH SET/VPS	
	S32	PU60392-Z	TACT SWITCH,COUNTER/REMAIN	
	S401	PU59292	SLIDE SWITCH,ALC ON/OFF	
	S402	PU59292	SLIDE SWITCH	
	S403	PU59292	SLIDE SWITCH	
	S405	PU59299	SLIDE SWITCH	
	FDP1	PEDP0013	FLUORESCENT DISPLAY PANEL	
	HD1	PQM30038-2-2	LED HOLDER,X3	
	HD2	PQ32934-1-1	FDP HOLDER(R)	
	HD3	PQ32933-1-1	FDP HOLDER(L)	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	WR1	PW30101-40AAZZA	PARALLEL WIRE(J1)	
	or	PW30115-40AAZZA	PARALLEL WIRE(J1)	
	WR2	PW30101-40AAZZB	PARALLEL WIRE(J2)	
	or	PW30115-40AAZZB	PARALLEL WIRE(J2)	
	CN5	PU58844-7	CAP HOUSING	
	CN7	PU58844-2	CAP HOUSING	

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JACK BOARD ASSEMBLY <36>

	PWBA	PB20466A	JACK BOARD ASSEMBLY,EG	
		PB20466B	JACK BOARD ASSEMBLY,E	
	R5,R6	PU60652	SLIDE VR	
	D1	SLH-34VC3F	LE DIODE	
	R1	PERE0437-02	V RESISTOR,MIC MIX	
	R2	QRD162J-103	RESISTOR	10kΩ,1/6W
	R3	PU60885	V RESISTOR,H.P. LEVEL	
	R4	PU60884	V RESISTOR,PICTURE SHARPNESS	
	R7	QRD162J-271	RESISTOR	270Ω,1/6W
	LC1	PU59885-223	N FILTER	
	LC2	PU59885-223	N FILTER	
	S1	PU53598-2	TACT SWITCH,POWER	
	S2	PU59292	SLIDE SWITCH,AC ONLINE	
	K1	PU60281-5	FERRITE BEADS	
	HD1	PQM30038-1-2	LED HOLDER	
	J1	PU60664-3	MINI JACK	
	J2	PU60452-2	MINI JACK	
	CN1	PU59555-6	CAP HOUSING	
	CN2	PU59513-8	CAP HOUSING	
	CN3	PU59555-5	CAP HOUSING	
	CN4	PU58844-5	CAP HOUSING	

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PRE/REC AMP BOARD ASSEMBLY <43>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10247G	PRE/REC BOARD ASSEMBLY	
	IC1	AN3386NK-A	IC	
	Q1	2SA1576(QRS)	TRANSISTOR	
	Q2	2SC4081(QRS)	TRANSISTOR	
	Q3	2SC4081(QRS)	TRANSISTOR	
	Q5	DTC144WU	TRANSISTOR	
	Q6	DTC144WU	TRANSISTOR	
	D1	1SS133	DIODE	
	or	MA165	DIODE	
	D2	MA141K	DIODE	
	D4	1SS133	DIODE	
	or	MA165	DIODE	
	R1	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R2	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R3	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R4	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R5	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R6	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R7	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R8	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R9	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R10	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R11	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
	R12	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R14	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
	R15	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R16	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R17	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R18	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R20	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R21	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R22	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R23	QRSA08F-563YN	RESISTOR	56kΩ,1/10W
	or	NRVA62D-563N	RESISTOR	56kΩ,1/16W
	R24	QRSA08J-184YN	RESISTOR	180kΩ,1/10W
	R25	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R26	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R28	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R29	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R30	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	R31	QRD161J-474	RESISTOR	470kΩ,1/6W
	C1	QER60JM-476	E CAPACITOR	47μF,6.3V
	C2	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C3	QCSA1HJ-681	CAPACITOR	680pF,50V
	C4	QCSB1HJ-150	CAPACITOR	15pF,50V
	C5	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C7	QCSA1HJ-270	CAPACITOR	27pF,50V
	C8	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C9	QCSA1HJ-910	CAPACITOR	91pF,50V
	C10	QCSA1HJ-471	CAPACITOR	470pF,50V
	C11	QCSA1HJ-390	CAPACITOR	39pF,50V
	C12	QCSA1HJ-680	CAPACITOR	68pF,50V
	C13	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C15	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C16	QER61CM-476	E CAPACITOR	47μF,16V
	C17	QCFA1HZ-333	CAPACITOR	0.033μF,50V
	C18	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C19	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C20	QCSA1HJ-101	CAPACITOR	100pF,50V
	C21	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C22	QCSA1HJ-101	CAPACITOR	100pF,50V
	C23	QCSA1HJ-101	CAPACITOR	100pF,50V
	C24	QCY81EK-104	CAPACITOR	0.1μF,25V
	C26	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C27	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C28	QCY81EK-104	CAPACITOR	0.1μF,25V
	C29	QCY81EK-104	CAPACITOR	0.1μF,25V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C30	QER61AM-685	E CAPACITOR	6.8μF,10V
	C31	QCF81EZ-224	CAPACITOR	0.22μF,25V
	C32	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C33	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C38	QCSA1HJ-2R0	CAPACITOR	2pF,50V
⚠	L1	PU54223-101K	COIL	100μH
	L2	PU59152-560J	COIL	56μH
	L3	PU59152-220J	COIL	22μH
	L4	PU59152-560J	COIL	56μH
	L5	PU59152-470J	COIL	47μH
	L6	PU59152-121J	COIL	120μH
	L7	PU59152-220J	COIL	22μH
⚠	L8	PU54223-470K	COIL	47μH
	SLD1	PQ32216-1-1	SHIELD CASE(1)	
	CN1	PU58844-106	CAP HOUSING	
	CN2	PU59555-106	CAP HOUSING	
	CN3	PU58844-104	CAP HOUSING	
	CN4	PU59974-11	CAP HOUSING	

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DECK TERMINAL BOARD ASSEMBLY <51>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10320A-02	DECK TERMINAL BOARD ASSY	
	Q1	PU60625	END SENSOR	
	R1	QRD161J-202	RESISTOR	2kΩ,1/6W
	R3	QRD161J-331	RESISTOR	330Ω,1/6W
	R4	QRD161J-331	RESISTOR	330Ω,1/6W
	R5	QRD161J-331	RESISTOR	330Ω,1/6W
	R7	QRD161J-202	RESISTOR	2kΩ,1/6W
	R8	NTH5D473KB	THERMISTOR	47kΩ
		or ERT-D2ZHK473S	NEGA THERMISTOR	47kΩ
	C1	QCVB1CM-103	CAPACITOR	0.01μF,16V
	PS1	PS5705HR	PH INTERRUPTER	
	PS2	PS5705HR	PH INTERRUPTER	
	CN1	PEMC0722-017	WIRE TRAP	
		or PEMC0753-017	WIRE TRAP	
	CN2	PU60642	7PIN CONNECTOR	
	CN3	PU60640	4PIN CONNECTOR	

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LOADING MDA BOARD ASSEMBLY <55>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA2	PB10320A2-01	LOADING MDA BOARD ASSY	
⚠	IC1	BA6418N	IC	
⚠		or XRA6418N	IC	
	C1	QETA1CM-336	E CAPACITOR	33μF,16V
	CN1	PU59555-104	CAP HOUSING	

* * *

CASSETTE HOUSING BOARD <56>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWB1	PB40041-01-01	CASSETTE HOUSING BOARD	
	Q2	PN268VI-NC	PHOTO TRANSISTOR	
	C1	QCC11EJ-103	CAPACITOR	0.01μF,25V
	PHS3	PU60629	CASS.SENSOR	
	CN2	PU60639	CONNECTOR(4PIN)	

SECTION 6
TECHNICAL INFORMATIONS

6.1 CPU pin functions

1. Mechacon CPU pin function (IC601)

Pin No.	Symbol	I/O format	Label	IN/OUT	Contents
1	Vcc	—	Vcc	—	For the SYSTEM CONTROL, DC 5V (AL 5V)
2	VREF	—	Vref		
3	DA	Analog	LCM 1	O	MODE MOTOR CONTROL
4	PWM	PWM	LCM 2		
5	Port 6 4	N-ch OPEN DRAIN	AVRG FM	I	AUTO TRACKING DATA INPUT
6	3		R. PAUSE IN		REMOTE PAUSE CONTROL (PAUSE ON: L)
7	2		THERM		THERMIC CORRECTION (SLOW BRAKE TIMING CONTROL)
8	1		MODE SENS 2		MECHANISM MODE DETECT
9	0		MODE SENS 1		
10	AN 7	Analog	MODE SENS 3		
11	6		REC SAFETY	I	DETECTS ERASE PROTECT TAB (TAB ABSENT: H)
12	5		START SENS	I	READER TAPE DETECT (DET ON: L)
13	4		DRUM CTL	O	DRUM MOTOR DRIVE VOLTAGE SERVO
14	Port 4 3	N-ch OPEN DRAIN	CAP CTL	I	CAPSTAN MOTOR DRIVE VOLTAGE SERVO
15	2		CASS SENS		CASSETTE LOARD/UN LOARD DETECT
16	1		END SENS		TRAILER TAPE DETECT (DET ON: L)
17	0		DRUM FF		REC TIMING CONTROL/DRUM ROTATION DETECT (25 Hz)
18	Port 3 7	N-ch OPEN DRAIN	CTL PULSE	I	MODE (SP/LP) DETECT/BLANK DETECT
19	6		V UP	O	CAPSTAN SPEED CONTROL (X11 MODE: H)
20	5		V PULSE	O	V PULSE OUTPUT
21	4		A/M/S	O	HEAD SELECT (AUTO/MANUAL/SLOW)
22	3		FADE	—	NC
23	2		PREROL		
24	1		REEL FG (SUP)	I	REEL ROTATION DETECT/TAPE REMAIN DATA
25	0		REEL FG (TU)		
26	INT-1	—	CAP FG	I	MODE (SP/LP) DETECT/BACK SPACE COUNT
27	CN Vss		CN Vss		GND
28	RESET		RESET		RESET AT CONNECT VCR TO AC
29	X IN		X IN	I	MAIN SYSTEM CLOCK
30	X OUT		X OUT	O	
31	ø		NC	—	NC
32	Vss		Vss	—	GND
33	Port 5 7	with Input Latch	HiFi REC START	O	HiFi REC START: L
34	6		VIDEO REC START	O	VIDEO REC START: L
35	5		SP	O	SP MODE: L
36	4		DOC	I	HiFi AUDIO DETECT/DROP OUT DETECT
37	3	High Impedance	PICTURE MUTE	O	PICTURE MUTE CONTROL (MUTE ON: H)
38	2		AUDIO MUTE		AUDIO MUTE CONTROL (MUTE ON: H)
39	1		FE CTL	—	NC
40	0		POWER ON	O	POWER CONTROL (POWER ON: H)
41	Port 1 7	N-ch OPEN DRAIN	EE	O	EE MODE: H
42	6		AUDIO REC START		AUDIO REC START: H
43	5		AUX		SIGNAL SELECT (AUX: L)
44	4		LP SPCL	—	NC
45	3		VIDEO REC	O	VIDEO REC: H
46	2		AUDIO REC		AUDO REC: H
47	1		L/ST/R		AUDIO SIGNAL CH SELECT (Lch/STEREO/Rch)
48	0		HiFi/MIX/NORM		AUDIO SIGNAL SELECT
49	Port 0 7	N-ch OPEN DRAIN	TNR/SC/AUX	O	INPUT SIGNAL SELECT (TUNER/SIMULCAST/AUX)
50	6		TUNER CTL		TUNER CONTROL (TUNER MODE: L)
51	5		M DATA		MEMORY IC CONTROL (DATA)
52	4		M CE		〃 (CHIP ENABLE)
53	3		D MUTE		DEMOD MUTE CONTROL (MUTE ON: H)
54	2		PLL DATA		PLL TUNING DATA
55	1		S/M/P CLK		CLOCK
56	0		S DATA		SERVO IC CONTROL DATA
57	Port 2 7	C MOS	SYNC DET	I	SYNC DETECT (NO SIGNAL: H)
58	6		LOCK DET	I	TUNING DATA OUTPUT CHECK
59	5		DUTY I/O	I/O	INDEX DATA WRITE/READ CONTROL (VISS)
60	4		PAUSE	O	CAPSTAN MOTOR SERVO
61	3		SERVO	O	〃
62	2		TIMER DATA	I/O	TM (TIMER/M-CTL CPU) BUS DATA (16 bit SERIAL)
63	1		TIMER CLK	I	CLOCK
64	0		REV	O	REV MODE: L

Table 6-1 Mechacon CPU pin function

2. IC1 pin function (Timer)

Pin No.	Symbol	Label	I/O	Contents
1	S3	Sd	O	KEY SCAN PULSE OUTPUT
2	S2	NC	–	NC
3	S1	Sb	O	KEY SCAN PULSE OUTPUT
4	S0	Sa		
5	P00/INT4	POWER DOWN	I	
6	P01/SCK	DISP/OS CLK	O	CLOCK
7	P02/SD	DISP/OS DATA		DISPLAY CONTROL/ON SCREEN DATA (8 bit) OUTPUT
8	P03/SI	TEST	I	TEST POINT
9	P10/INT0	REMOTE	I	16 bit REMOTE DATA INPUT (A/B CODE)
10	P11/INT1	CATV CTL	–	NC
11	P12/INT2	NC		
12	P13/T10	CNT PLS	I	COUNTER DATA
13	P20	KS0	I	KEY SCAN DATA INPUT
14	P21	KS1		
15	P22	KS2		
16	P23/BUZ	KS3		
17	P30	M/C DATA	I/O	TM (TIMER/M-CTL CPU) BUS : 16 bit SERIAL DATA
18	P31	M/C CLK	I	: CLOCK
19	P32	SDA	I/O	VIDEO PROGRAMMING SYSTEM : I^2 C BUS
20	P33	SCL	O	: CLOCK
21	P60	OS CE	O	ON SCREEN CONTROL : CHIP ENABLE
22	P61	OS RESET		: RESET
23	P62	DISP CE	O	DISPLAY CONTROL (CHIP ENABLE)
24	P63	NC	–	NC
25	P40	POWER LED	O	LED CONTROL (POWER ON: H)
26	P41	VIDEO		VIDEO MODE: H
27	R42	SC		SIMUL CAST MODE : H
28	P43	PROG		PROGRAM MODE: H (ON SCREEN)
29	PP0	NC	–	NC
30	X1	X1	I	MAIN SYSTEM CLOCK
31	X2	X2	O	
32	Vss	Vss	–	GND
33	XT1	XT1	I	
34	XT2	NC	–	NC
35	P50	NC		
36	P51	NC		
37	P52	NC		
38	P53	NC		
39	RESET	RESET	I	RESET AT CONNECT VCR TO AC
40	T0	NC	–	NC
41	T1	NC		
42	T2	NC.		
43	T3	NC		
44	T4	NC		
45	T5	NC		
46	T6	NC		
47	T7	NC		
48	T8	NC		
49	T9	NC		
50	T10/S15/PH3	NC		
51	T11/S14/PH2	So	O	KEY SCAN PULSE OUTPUT
52	T12/S13/PH1	Sn		
53	T13/S12/PH0	NC	–	NC
54	T14/S11	NC		
55	T15/S10	NC		
56	VLOAD	VLOAD	I	FDP DRIVE
57	VPRE	VPRE		
58	S9	NC	–	NC
59	S8	NC		
60	S7	Sh	O	KEY SCAN PULSE OUTPUT
61	S6	Sg		
62	S6	Sg		
63	S4	Se		
64	VDD	VDD	–	5 V For the SYSTEM CONTROL

Table 6-2 IC1 pin function

2. IC1 pin function (Timer)

Pin No.	Symbol	Label	I/O	Contents
1	S3	Sd	O	KEY SCAN PULSE OUTPUT
2	S2	NC	–	NC
3	S1	Sb	O	KEY SCAN PULSE OUTPUT
4	S0	Sa		
5	P00/INT4	POWER DOWN	I	
6	P01/SCK	DISP/OS CLK	O	CLOCK
7	P02/SD	DISP/OS DATA		DISPLAY CONTROL/ON SCREEN DATA (8 bit) OUTPUT
8	P03/SI	TEST	I	TEST POINT
9	P10/INT0	REMOTE	I	16 bit REMOTE DATA INPUT (A/B CODE)
10	P11/INT1	CATV CTL	–	NC
11	P12/INT2	NC		
12	P13/T10	CNT PLS	I	COUNTER DATA
13	P20	KS0	I	KEY SCAN DATA INPUT
14	P21	KS1		
15	P22	KS2		
16	P23/BUZ	KS3		
17	P30	M/C DATA	I/O	TM (TIMER/M-CTL CPU) BUS : 16 bit SERIAL DATA
18	P31	M/C CLK	I	: CLOCK
19	P32	SDA	I/O	VIDEO PROGRAMMING SYSTEM : I^2 C BUS
20	P33	SCL	O	: CLOCK
21	P60	OS CE	O	ON SCREEN CONTROL : CHIP ENABLE
22	P61	OS RESET		: RESET
23	P62	DISP CE	O	DISPLAY CONTROL (CHIP ENABLE)
24	P63	NC	–	NC
25	P40	POWER LED	O	LED CONTROL (POWER ON: H)
26	P41	VIDEO		VIDEO MODE: H
27	R42	SC		SIMUL CAST MODE : H
28	P43	PROG		PROGRAM MODE: H (ON SCREEN)
29	PP0	NC	–	NC
30	X1	X1	I	MAIN SYSTEM CLOCK
31	X2	X2	O	
32	Vss	Vss	–	GND
33	XT1	XT1	I	
34	XT2	NC	–	NC
35	P50	NC		
36	P51	NC		
37	P52	NC		
38	P53	NC		
39	RESET	RESET	I	RESET AT CONNECT VCR TO AC
40	T0	NC	–	NC
41	T1	NC		
42	T2	NC		
43	T3	NC		
44	T4	NC		
45	T5	NC		
46	T6	NC		
47	T7	NC		
48	T8	NC		
49	T9	NC		
50	T10/S15/PH3	NC		
51	T11/S14/PH2	So	O	KEY SCAN PULSE OUTPUT
52	T12/S13/PH1	Sn		
53	T13/S12/PH0	NC	–	NC
54	T14/S11	NC		
55	T15/S10	NC		
56	VLOAD	VLOAD	I	FDP DRIVE
57	VPRE	VPRE		
58	S9	NC	–	NC
59	S8	NC		
60	S7	Sh	O	KEY SCAN PULSE OUTPUT
61	S6	Sg		
62	S6	Sg		
63	S4	Se		
64	VDD	VDD	–	5 V For the SYSTEM CONTROL

Table 6-2 IC1 pin function

E. & O. E. No. 82184